# SIR GEORGE WILLIAMS UNIVERSITY

## ARTS · SCIENCE · COMMERCE · ENGINEERING

# 1967 68



# SIR GEORGE WILLIAMS UNIVERSITY

1435 Drummond Street
Montreal 25, Quebec

ACADEMIC YEAR 1967-68

## THE FACULTIES OF ARTS/SCIENCE/COMMERCE/ENGINEERING

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## CALENDAR OF EVENTS

## ACADEMIC YEAR 1967-68

### 1967

| | |
|---|---|
| Saturday, April 1. | Last day for applications — Day Division. |
| Monday, May 15. | Registration begins—Summer Session (evening). |
| Thursday, May 18. | Registration closes—Summer Session (evening). |
| Sunday, May 28. | Spring Convocation. |
| Tuesday, May 30. | Classes begin—Summer Session (evening). |
| Friday, June 23. | Last day for supplemental examination applications. |
| Wednesday, June 28. | Classes begin—Special Summer Sessions (day) —Geography and French. |
| Saturday, July 1. | Dominion Day. |
| Monday, July 10. | Classes begin—Special Summer Sessions (day) —English, Sociology and History. |
| Wednesday, July 19. | Supplemental examinations begin. |
| Thursday, July 27. | Classes end—Summer Session (evening). |
| Saturday, July 29. | Supplemental examinations end. |
| Monday, July 31. | Examinations begin—Summer Session (evening). |
| Tuesday, August 1. | Last day for applications—Evening Division. |
| Thursday, August 3. | Examinations end—Summer Session (evening). |
| Wednesday, August 9. | Classes end—Special Summer Sessions (day) —Geography and French. |
| Monday, August 14. | Classes begin—Special Summer Session (day) —Applied Social Science. |
| Tuesday, August 22. | Classes end—Special Summer Sessions (day) —English, Sociology and History. |
| Saturday, August 26. | Classes end—Special Summer Session (day) —Applied Social Science. |
| Monday, September 4. | Labour Day—University closed. |
| Tuesday, September 5. | Registration begins. |
| Thursday, September 14. | Registration closes. NO LATE REGISTRATION. |
| Monday, September 18. | Classes begin—Day and Evening Divisions. |
| Monday, October 9. | Thanksgiving Day—no DAY classes. |
| Friday, November 3. | Last day for applications—supplemental examinations, Summer Sessions. |
| Saturday, November 11. | Remembrance Day. |
| Friday, November 17. | Fall Convocation. |
| Saturday, December 2. | Supplemental examinations—Summer Sessions. |
| Saturday, December 16. | Last day of classes—first term. |
| Monday, December 18. | Progress examinations (Day and Evening Divisions). |
| Friday, December 22. | Last day of progress examinations. |



### 1968

| | |
|---|---|
| Wednesday, January 3. | First-term final examinations. |
| Monday, January 8. | Classes begin, second term—Day and Evening Divisions. |
| Monday, April 1. | Last day for applications—Day Division. |
| Saturday, April 6. | Last day of classes—second term. |
| Friday, April 12. | Good Friday—University closed. |
| Monday, April 15. | Easter Monday—Evening Division final examinations begin. |
| Tuesday, April 16. | Day Division final examinations begin. |
| Saturday, April 27. | Last day of examinations. |
| Last week of May. | Convocation Week. |
| Saturday, June 22. | Last day for supplemental examination applications. |

### 1967

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### 1968

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**JUNE**

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**JULY**

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**AUGUST**

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Wright, V. Jean, B.A. (U.B.C.),
*Lecturer in English*
Yedid, Joyce, B.A. (S.G.W.), M.A. (Buffalo),
*Conference Leader in English*
Yuranyi, Steve,
*Lecturer in Fine Arts*
Zuker, Esther, B.A. (McGill), M.A. (Columbia),
*Lecturer in English*

## VISITING PROFESSORS

C. B. Cox, University of Manchester,
*Visiting Professor of English*
A. E. Dyson, University of East Anglia,
*Visiting Professor of English*
Scott A. Greer, Northwestern University,
*Visiting Professor of Sociology*
A. N. Kaul, Yale University,
*Visiting Professor of English*
Arnold Kettle, University of Leeds,
*Visiting Professor of English*
Blake McKelvey, City Historian, Rochester, N.Y.,
*Visiting Professor of History*



G. Duncan Mitchell, University of Exeter,
*Visiting Professor of Sociology*
Stephan Nowakowski, University of Warsaw,
*Visiting Professor of Sociology*
Fernand Ouellet, Carleton University,
*Visiting Professor of History*
Norman Pollack, Wayne State University,
*Visiting Professor of History*
F. E. L. Priestley, University College, Toronto,
*Visiting Professor of English*
A. J. M. Smith, Michigan State University,
*Visiting Professor of English*
Charles Tilly, University of Toronto,
*Visiting Professor of Sociology*
Fred W. Voget, Southern Illinois University,
*Visiting Professor of Anthropology*
Samuel E. Wallace, Brandeis University,
*Visiting Professor of Sociology*

# History and Aims of the University

## THE HISTORY AND THE AIMS OF THE UNIVERSITY

Sir George Williams University is a Corporation chartered by the Provincial Legislature to conduct a "University within the Province of Quebec," and empowered by that Charter to grant the appropriate degrees, diplomas, and certificates.

It is the concentration of formal education in the Montreal Y.M.C.A., and developed from the formal educational work of that Association which was inaugurated in 1873, and took the form, at that time, of unit evening courses in vocational and general educational subjects, later co-ordinated into the system known as the Y.M.C.A. schools.

In 1920, the Evening High School was inaugurated to meet the educational needs of young men employed in Montreal, and in 1926, the name Sir George Williams College was adopted, to designate from that time forward, the expanding formal educational programme of the Young Men's Christian Association in Montreal. (Sir George Williams was the founder of the Y.M.C.A. in London, June 6, 1844, seven years before it was established in Canada, when, in 1851, in Montreal, the first Y.M.C.A. in North America was established.) At the same time, the College was made co-educational.

In 1928, the Association held a building campaign for $1,500,000, part of which sum was to provide enlarged facilities for the work of the College.

In 1929, the College programme was extended to include the first year of studies at the university level in Arts, Science, Commerce, and pre-Engineering, in the evenings, only. From that time onward, the institution, particularly in its university level courses, has grown yearly and rapidly. In 1931, in spite of the depression, the Junior College was organized, offering two full years of University work in Arts, Science, and Commerce, and leading to the Diploma of Associate, and in 1932, day courses were inaugurated for the first time, providing pre-professional and Associate programmes of study in the same three fields. Finally, in 1934, the two-year programmes in Arts, Science, and Commerce were expanded to four-year curricula culminating in the award of the Bachelor's Degree in Arts, Science, and Commerce. The members of the first class graduated in 1936.

During these years the College was conducted under a Charter of the Montreal Young Men's Christian Association (consolidation, June 1888). In March, 1948, however, it was granted a Charter in its own right as a college or university (Quebec, No. 175, 12 George VI, 1948), establishing it a body corporate and politic. By special by-law of agreement, however, it still operates as the formal educational arm of the Montreal Young Men's Christian Association, and as such characteristically is still concerned with young men



and women who are employed in the day and in their full development as persons, spiritually, intellectually, and socially, through the medium of its formal educational programmes and related extra-curricular activities. But in spite of this emphasis and concern for its evening classes, a programme of full-time studies for day students is constantly expanding to meet the needs in this area. And, although Sir George Williams is fundamentally a Christian institution, and Christian education therein is of the utmost importance, its doors are open without discrimination to all those of other faiths who wish to come.

In 1952, the Association held a building campaign for $3,300,000, the major part of which provided the college with a new building especially designed and built to accommodate its activities, hitherto housed, in its rapid expansion, in inadequate and temporary "annexes" throughout the neighbourhood. In 1956, the College occupied a new building constructed especially for its use from funds contributed by the community. These quarters were soon being used beyond their intended capacity. After continuing study, the university decided to expand its facilities and an additional building called the Henry F. Hall Building, was occupied in June, 1966. The University is still studying its future and the ways in which it can make an even better contribution to the community.

A first step in this direction was made in 1957 when a three-year Engineering programme was added to the curriculum. The fourth year was offered for the first time in 1966, and the fifth year, leading to the degree of Bachelor of Engineering (Civil, Electrical, and Mechanical) is planned for 1967. 1966, also saw the introduction of courses leading to the degree of Bachelor of Fine Arts. In 1961 the first Honours programmes were announced and in 1965, graduate courses were approved.

Without a campus, located as it is in the heart of downtown Montreal where it is most readily accessible to its students, Sir George Williams has grown over the years, not only in numbers, but in the acceptance and esteem of its community and among other institutions of higher learning. Its status was clarified on December 18, 1959, when the Provincial Legislature passed an amendment to its act of incorporation changing its name to Sir George Williams University.

The fundamental educational philosophy of Sir George Williams University is that its chief concern shall be the development of persons, through the medium of formal education and its correlated activities. It is recognized that this is not accomplished by mere rote

learning. While the subject matter of the curriculum is divided into "courses" for the sake of convenience in administration, the primary aim of the University is that students shall grow in character and personality as well as in those techniques and appreciations which may be required in full and satisfactory living. The units which go to make up such growth may be conveniently classified as attitudes, abilities, and skills. It is the development of these that the University endeavours to foster in its students.

This principle is not in the least opposed to good scholarship. On the contrary, scholarship can be sound only when it is vital, when it is a living process. For example, attitudes, or ways of feeling toward individuals, institutions, and other elements of one's environment, are as much a part of a person's growth as is the attainment of information, important though this may be.

Because of varying interests, aptitudes, and vocational aims, a modern educational institution must provide a wide range of educational experiences for its students. In the University these experiences, traditionally called the "curriculum", are divided into three broad areas of life, viz.: (a) the nature of the world in which we live (the Natural Sciences), (b) the nature of man and of the society of which he is a part (the Social Sciences), and (c) the cultural heritage of thought, language, and the arts which, though it reaches back to the dawn of history, is being continuously remade in our day (the Humanities). Believing that educated people should come into intimate contact with all of these areas of life, it is provided that the academic experience of every student shall include work in each of these major fields. One attempt to accomplish this is the provision of the three exploratory or survey courses in these three fields. The emphasis placed upon the study of contemporary English literature and of modern writings in the fields of science, social science, and the arts is another indication of this point of view.

A fourth division of the University Curriculum (Commerce) is oriented toward education for business careers. Although the programme draws upon a number of disciplines, including the Sciences, the Arts, and the Humanities, it is more than interdisciplinary in the traditional sense of the word. The goal is to demonstrate how information and knowledge from many disciplines are appropriate to problematic situations faced by management.

The members of the staff of Sir George Williams University are interested in the teaching and guidance of students, and contacts between faculty members and students are not confined to the classroom. While students are encouraged to do independent and constructive work, staff members are available for consultation.



## Evening Division

For employed men and women who are unable to attend University during the day, the Evening Division of the University offers the same programmes and courses of study as are given in the Day Division. The outlines of the various courses of study as listed in this Announcement, therefore, apply to both Day and Evening Divisions. As the standard of achievement demanded by the students of both divisions is identical, equal academic credit is accordingly granted.

In 1963 Sir George Williams University offered in its Evening Division sections of several of its basic introductory degree courses in the French language. This experiment, which has been continued is designed to be helpful to evening students who are able to take university work in the French language. Those courses which will have French sections during the 1967-68 academic year are listed in the university timetable for the Evening Division.

## Degrees, Diplomas and Certificates

DEGREE OF BACHELOR. The University is divided into four faculties; Arts, Science, Commerce, and Engineering. The degrees of Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Science, and Bachelor of Commerce are awarded upon completion of four-year courses of study in the Day Division or the equivalent in the Evening Division. The degree of Bachelor of Engineering is awarded after the completion of a five-year programme of study in the Day Division. Only the first three years of the programme are offered in the Evening Division.

DEGREE OF MASTER. Graduate programmes of study are available leading to the degrees of Master of Arts in Art Education, Economics, English and History and Master of Science in Chemistry and Physics. A Master in The Teaching of Mathematics is also offered.

DIPLOMA IN ASSOCIATION SCIENCE. This diploma is awarded to students training for Y.M.C.A. secretaryship, for professional training taken concurrently with studies for the Bachelor's degree.

CERTIFICATE IN ENGINEERING. Students who successfully complete the three-year programme in Engineering in the Evening Division will be awarded a Certificate in Engineering.

CERTIFICATE OF CREDIT. Students taking partial programmes, i.e., those who are following one or more subjects but are not proceeding to a degree or diploma, are awarded a Certificate of Credit in each subject upon completing the required work and passing the required examination, upon request at the Records Office.

### Graduation Ceremonies

The Spring Convocation is held each year around the end of May. On this occasion those who have completed their studies during the regular session of the University receive their awards. The Degrees of Bachelor and Master, the Certificates in Engineering, and the Diplomas in Association Science are all presented at the Spring Convocation. Winners of the major prizes of the University are also announced.

The Fall Convocation is held around the end of November for students who have completed degree requirements during the summer session or by means of extra examinations. Any student graduating in the Fall is considered to be a member of the graduating class of the following year, and is eligible for prizes, etc., at that time.

### Enrollment

The total enrollment of Sir George Williams University and the Sir George Williams Schools during the regular winter session of 1966-1967 was 19,143 individual students. Of these 14,007 were in the University (Faculties of Arts, Science, Commerce, and Engineering), day and evening divisions. During the summer session, 1966, there were 4,775 students enrolled in the University and Schools. Of these 3,102 were in the University.

### Men and Women Students

The University is co-educational, women being admitted to all courses on the same basis as are men.

# Undergraduate Studies

# Admission and Advanced Standing Regulations

# ADMISSION TO UNDERGRADUATE STUDIES

## Classification of Students

(1) **Undergraduate Students:** Undergraduate students are those who, at the time of registration meet the full admission requirements of the University and enroll in either the Day or Evening Division with the intention of completing the work required for a degree or a diploma. If the student is proceeding towards a degree, he will be classified as an undergraduate whether he is taking several subjects or only one in any given year.

(2) **Partial Course Students:** Partial course students are those who, at the time of registration do not expect to proceed to a degree or a diploma irrespective of the number of subjects they may be following in any given year. Students who register as partial students are not considered to have matriculated, have no standing towards any degree at the University, and may enroll in the Evening Division only. If a partial student later transfers to undergraduate standing, he may receive credit towards his degree for the courses already taken, provided they apply towards the degree requirements at the time of transfer.

## REQUIREMENTS FOR ADMISSION TO UNDERGRADUATE STANDING IN THE UNIVERSITY

**The University reserves the right to refuse admission even when the stated requirements for entrance have been satisfied.**

### (A) APPLICATION FOR ADMISSION

It is recommended that application for admission be made as early as possible on forms provided by the Director of Admissions. Academic certificates and other supporting documents not available at the time of application must be submitted as soon as they become available.

### (B) LAST DATE FOR RECEIPT OF APPLICATIONS:

DAY DIVISION, Winter Session (September to April):

Applications for admission to undergraduate standing in the Day Division of the University must be submitted before April 1st. All applications originating outside of Canada must be received before March 1st.

EVENING DIVISION, Winter Session (September to April):

Applications for admission to undergraduate standing for the session commencing in September must be received before August 1st.

EVENING DIVISION, Summer Session (May to August):

Applications for admission to undergraduate standing in the Evening Division for the session commencing in May must be submitted before April 15th.



### (C) APPLICATION FEE

All applications for undergraduate standing must be accompanied by an application fee of $10 (Canadian), payable by certified cheque or money order. It is not refundable under any circumstances nor will it be applied towards tuition fees.

### (D) MEDICAL EXAMINATION REPORT (Day Applicants Only)

Each student who is granted admission to the Day Division of the University must submit a Medical Examination Report on the form provided by the Director of Admissions. The medical report is not required until the student has received formal notification of acceptance.

### (E) ADMISSION DEPOSIT (Day Applicants Only)

A deposit of $250. (Canadian) is required of each successful candidate in order to reserve a place in classes for the student. It is due as soon as an official notice of acceptance has been received by the student. This deposit is intended as confirmation of Sir George Williams as the final choice of a student who has made application to other universities. It will not be refunded under any circumstances, but will be applied towards tuition fees.

### CRITERIA FOR ADMISSION

### (A) University Admission Tests

Each applicant to the University (freshmen and upperclassmen) is required, as part of the admission process, to complete a psychological test programme designed to collect information relating to the personality, aptitudes, interests, and study habits of the individual student. Such information is subsequently used as a basis for admission and for academic, vocational and personal counselling and guidance. It is not possible to study for these tests as they are not designed to measure achievement in academic subjects. The results of these tests will not be discussed with the applicant until he has become a registered student of the University.

### (B) Secondary School Leaving Certificate (or equivalent)

Each applicant must submit, as soon as it is available, an original High School Leaving Certificate (not a copy) which includes a certified list of final marks in each subject. A student applying for admission on the basis of a Senior Matriculation Certificate must also present his Junior High School Leaving Certificate.

### (C) The Principal's Confidential Report

Each candidate for admission to the Day Division on the basis of a Junior or Senior High School Leaving Certificate must have his Principal submit a Confidential Report on the form provided by the Director of Admissions.

A student who is attending High School in the Province of Quebec is not required to submit the Principal's Confidential Report as this document will be obtained directly from the High School by the Director of Admissions.

An applicant to the Evening Division is not required to submit a Principal's Confidential Report unless requested.

### (D) The Complete Secondary School Record

Each applicant for admission to the Day Division on the basis of a Junior or Senior High School Leaving Certificate must submit a certified copy of his complete High School Record, including final marks in each subject in each year except the current year, and mid-term marks for the current year.

A student who is attending High School in the Province of Quebec is not required to submit the complete High School Record as this document will be obtained directly from the High School by the Director of Admissions.

A candidate for admission to the Evening Division is not required to have a complete High School Record submitted unless requested.

### (E) English Language Requirements

*Sir George Williams University English Language Tests*

Every non-English-speaking student* will be tested for his competence in English prior to his entry to the University by writing the Sir George Williams University English Language Test. If his performance indicates an insufficient knowledge of the English language, he will be required to take a non-credit course (English 200) designed to bring him up to a satisfactory standard of expression. A student will remain in this course until, in the opinion of the instructor, he is able to express himself competently and coherently. If his performance in the test indicates a satisfactory knowledge of the English Language, he will be granted an exemption from English 200.

Once the non-English-speaking student has passed English 200 or has been granted an exemption from it, he will not have to take English 201 or 211 to obtain a degree. However, if he is later discovered to have an inadequate command of English he may be required to return to English 200 for further instruction.

Students who have passed English 200 or have been granted an exemption from it, and who wish to improve their knowledge of English, may enroll in English 201. This is a college-level composition course designed for students for whom English is a secondary language.

*"*Non-English-speaking student*" *means any student who has not had all of his high school in English.*



*Test of English as a Foreign Language.*

Any student whose first language is other than English, and who is applying from outside Canada must demonstrate that he is proficient in English language by writing the Test of English as a Foreign Language administered by the Educational Testing Service.

Information and applications to write the test may be obtained by writing to: Test of English as a Foreign Language, Educational Testing Service, Princeton, New Jersey, U.S.A.

Foreign students who are accepted to the University will be required to write the Sir George Williams English Language Test after their arrival in Montreal.

## *EARLY FINAL ADMISSION*

Superior high school students seeking admission as freshmen to the Day Division may be granted admission on the basis of:

a) The University Admission Tests
b) The Principal's Confidential Report
c) The Complete Secondary School Record, including final marks in each subject in each year, except the current year, and mid-term marks for the current year.

Any student who is admitted on the above basis must submit his High School Leaving Certificate as soon as possible (prior to registration) even though it is not used as a criterion for admission.

## *REQUIREMENTS FOR ADMISSION TO FIRST YEAR*

### *Province of Quebec*

DEGREE OF BACHELOR OF ARTS AND BACHELOR OF FINE ARTS

Students seeking admission to undergraduate standing in Arts must be enrolled in appropriate courses of the final year of high school or must present satisfactory proof of graduation from high school with an average of at least 60% on ten academic papers (at least 50% in any individual paper) on the Quebec High School Leaving Examinations, or the equivalent, including papers in English Literature and Composition.

DEGREE OF BACHELOR OF SCIENCE AND BACHELOR OF ENGINEERING

Students seeking admission to undergraduate standing in Science or Engineering must be enrolled in appropriate courses of the final year of high school or must present satisfactory proof of graduation from high school with an average of at least 60% on ten academic papers (at least 50% in any individual paper) on the Quebec High School Leaving Examinations, or the equivalent, including papers in English Literature, English Composition, Algebra, Geometry and at least one Science.

## Degree of Bachelor of Commerce

Students seeking admission to undergraduate standing in Commerce must be enrolled in appropriate courses of the final year of high school or must present satisfactory proof of graduation from High School with an average of at least 60% on ten academic papers (at least 50% in any individual paper) on the Quebec High School Leaving Examinations, or the equivalent, including papers in English Literature, English Composition, Algebra and Geometry.

***Province of Ontario***

A candidate to be considered for admission at Junior Matriculation level must present the Secondary School Graduation Diploma or its equivalent with standing in:

(1) English, History (pts. 1 and 2).

(2) Any three of—Mathematics (pts. 1 and 2), Science (Physics and Chemistry), Geography (pts. 1 and 2), French, Latin, Greek, German, Spanish, Italian, Russian.

(3) One of—an option not chosen from (2); Commercial Subjects, Industrial Arts or Technical Subjects, Home Economics, Art, Music.

An overall average of at least 60% is required. Those students applying for admission to the Faculty of Commerce must offer Mathematics (pts. 1 and 2), and those who wish to enter the Faculty of Science or Engineering must include Mathematics (pts. 1 and 2) and Science (Physics and Chemistry).

***Other Provinces***

The specific papers required for entrance on the basis of other Provincial Certificates may be obtained by writing to the Office of the Director of Admissions.

## List of Equivalent Certificates

The following certificates are accepted as fulfilling the requirements for entrance to the FIRST YEAR of courses in the University provided that a standing equivalent to a 60% average on the Quebec High School Leaving Certificate is indicated.

***Province of Quebec:***

a) The Quebec Protestant or Catholic High School Leaving Certificate, or the McGill Junior School Certificate.
A grade XI Certificate is required from French high schools. Those who completed high school prior to 1964 are required to submit the grade XII Certificate.

b) The Graduation Diploma of Sir George Williams High School.

c) The Graduation Diploma of certain secondary schools.

d) Completion of "Rhetorique" in one of the classical colleges.



***Other Provinces:***

| | |
|---|---|
| a) Newfoundland: | The Grade XI Matriculation Diploma. |
| b) Prince Edward Island: | The results of the Grade XII Examinations of the Department of Education or the Second Year Certificate, Prince of Wales College. |
| c) Nova Scotia: | The Grade XI Certificate issued by the Department of Education or the High School Diploma of St. Dunstan's University. |
| d) New Brunswick: | The Grade XII Graduation Diploma. |
| e) Ontario: | The Grade XII Secondary School Graduation Diploma. |
| f) Manitoba: | The Grade XI Certificate. |
| g) Saskatchewan: | The Grade XI Certificate. |
| h) Alberta: | The Grade XI Certificate. |
| i) British Columbia: | The High School Graduation Diploma—Grade XII. |

Applicants for admission to the first year of any of the faculties who do not quite meet the requirements may make up deficiencies by taking courses in Sir George Williams Evening High School before entering the University.

**Admission to SECOND YEAR on the basis of a Senior High School Leaving Certificate.**

A student applying on the basis of Senior Matriculation will, in general, be given credit in the first year, course for course, for subjects completed provided that the minimum academic requirements have been satisfied. Certain conditions are attached to the granting of credits for courses completed in a Senior Matriculation programme. Not more than five credits will be allowed in any circumstance. The University may require certain courses not included in these certificates to be made up in the second year. Once a student has registered for courses at Sir George Williams no further credits will be allowed for courses subsequently passed elsewhere, at the Senior High School Leaving Certificate level.

A student transferring from a Senior Matriculation programme after a failed year will not be given credit for any courses successfully completed in the failed year. It is possible, however, to substitute other courses for the passed courses instead of having to repeat them.

***Province of Quebec***

DEGREE OF BACHELOR OF ARTS, BACHELOR OF FINE ARTS, BACHELOR OF SCIENCE AND BACHELOR OF COMMERCE.

A candidate to be considered for admission from a Senior Matriculation programme is, in general, required to present an overall average of at least 60% in five subjects successfully completed on the Quebec Senior High School Leaving Certificate, or its equivalent. However, a student who has achieved a passing grade in fewer than five subjects may be considered provided that an overall average of 60% has been obtained and satisfactory grades are offered in those subjects which are significantly important as regards the programme of study for which application has been made. It should be noted that certain conditions are attached to the granting of credit for courses completed in a Senior Matriculation programme.

DEGREE OF BACHELOR OF ENGINEERING

A student presenting a Quebec Senior High School Leaving Certificate or its equivalent, including English Literature and English Composition, Physics, Chemistry, and at least Intermediate Algebra, Analytic Geometry and Trigonometry (on either Junior or Senior Matriculation Certificates), will be considered for admission to second year.

Students admitted in this manner will take Engineering 212 in second year, in lieu of English Literature, for which they will already have received credit.

***Province of Ontario***

A candidate to be considered for admission to undergraduate standing in Arts, Fine Arts, Science or Commerce from Grade XIII in the Province of Ontario is, in general, required to present an overall average of at least 60% in eight credits on the Secondary School Honour Graduation Diploma, or its equivalent. English and language subjects will be counted as two credits. All other subjects will be counted as one credit each, eg. Biology, History, Trigonometry. It should be noted that certain conditions are attached to the granting of credit for courses completed in a Senior Matriculation programme.

A student who intends to enter the Faculty of Engineering must include papers in English, Physics, Chemistry, Intermediate Algebra, Analytic Geometry and Trigonometry on the Secondary School Honour Graduation Diploma.



***Other Provinces***

Applicants from other Provinces wishing to apply to second year on the basis of Senior Matriculation, may obtain additional information from the Office of the Director of Admissions.

The following certificates are accepted as fulfilling the requirements for entrance to the SECOND YEAR of the University provided that a standing equivalent to a 60% average on the Quebec Senior High School Leaving Certificate is achieved.

***Province of Quebec***

a) The Quebec Senior High School Leaving Certificate—Protestant or Catholic.
b) McGill Senior School Certificate.

***Other Provinces***

| | |
|---|---|
| a) Newfoundland: | The Grade XII results of the Atlantic Provinces Examing Board. |
| b) Prince Edward Island: | The Grade XII results of the Atlantic Provinces Examing Board or the Graduation Certificate of Prince of Wales College—3rd year. |
| c) Nova Scotia: | The High School Certificate, Grade XII, Department of Education, Nova Scotia. |
| d) New Brunswick: | The Grade XIII Certificate of Moncton High School. |
| e) Ontario: | The Secondary School Honour Graduation Diploma. |
| f) Manitoba: | The Grade XII Certificate. |
| g) Saskatchewan: | The results of the Grade XII Examinations of the Province of Saskatchewan. |
| h) Alberta: | The Senior High School Diploma—Grade XII. |
| i) British Columbia: | Senior Matriculation Certificate—Grade XIII. |

**ADMISSION REQUIREMENTS FROM OTHER COUNTRIES**

**United States:** Those applying from high schools in the United States are generally required to present at least sixteen units of secondary school credits, including four credits in English. Those applying to Science or Engineering should present three units in Mathematics and two units in the Sciences. Those applying to Commerce should include two or three units in Mathematics. In certain cases, the Committee on Admissions may approve slight deviations from the above pattern.

**Commonwealth Countries:** Applicants offering Commonwealth certificates such as the General Certificate of Education, the Cambridge Overseas Certificate, the Scottish Certificate of Education, or the West African Certificate of Education must present five papers at the Ordinary level (excluding Commercial Subjects, Domestic Science, Health Science, and Religious Knowledge). Credit towards the degree may be given for Advanced, Principal, or Higher Level passes

**Hong Kong:** The Hong Kong English School Certificate or the Hong Kong Chinese School Certificate—six papers, of which three must be at the credit level. Applicants who have fewer than three credit level passes may meet the minimum entrance requirement by presenting Ordinary Level passes on the General Certificate of Education in lieu of credit passes on the Hong Kong School Certificate.

**Other Certificates**

Certificates other than those mentioned above may be submitted to the Director of Admissions for examination and evaluation.

**Special Examinations**

Normally, students will not be permitted to write examinations for courses for which they are not registered at the University. Under special circumstances, in order to validate certain courses for which proper certificates are not available, students may be permitted, by approval of Faculty Council, to obtain credit for such courses upon passing a special examination.

***ADMISSION ON MATURE MATRICULATION***

Persons 21 years of age or over who have not satisfied the technical requirements for high school graduation but who have the capacity to do University work are admitted as undergraduates. They are required to write a psychological testing programme, the results of which are used as a basis for admission.

***ADMISSION AS A PARTIAL COURSE STUDENT***

Partial course students are not required to submit an application form; they need only apply for admission and register for courses at the time of registration. An appointment card for registration may be obtained from the Records Office approximately two weeks prior to the commencement of registration.

Commencing with the 1968 Summer Session, partial course students will be required to complete an *Application for Partial Course Students*. The appropriate application form will be available at the Admissions Office. Partial students will also be required to pay an application fee of $10 and write a battery of Admissions Tests.



Partial course students must either satisfy the minimum entrance requirements of the University or be 21 years of age or over and have, through other experiences, the essential background for the courses.

***EVENING TO DAY TRANSFER***

Undergraduates who wish to transfer from the Evening Division of the University to the Day Division are, in general, required to have successfully completed courses equivalent to at least five credits. Application for transfer is made on forms for transfer provided by the Office of the Director of Admissions.

## APPLICATION FOR ADVANCED STANDING

Students who wish to apply for advanced standing upon the basis of work already completed in other colleges or universities should understand the following conditions:

1) Each application for advanced standing is considered on its own merit. Two official transcripts must be mailed directly from the university formerly attended before the application for advanced standing will be entertained.

2) A student presenting evidence that he has completed one year of university work elsewhere will normally be admitted to the second year at this University. It is provided, however, that if such a student's first year selection of subjects has not coincided with the major curricular requirements of Sir George Williams, the deficiency must be made up in the second year.

3) A student transferring from other universities to the third or fourth year may be given full standing for the first and second years of his work depending upon the programme previously followed. The University will have the right to insist that certain courses not taken in the first or second year be included as part of the third or fourth year's work where this seems advisable.

4) In order to obtain a degree or diploma, a candidate must do the equivalent of at least one full academic year's work (including the final year) in the University irrespective of the amount of pro tanto credit allowed (See Residence Requirements).

5) A student holding a degree from another university, who enters this University to obtain a second degree, or a graduate of Sir George Williams University who may wish to qualify for a second Bachelor's degree, must do the equivalent of two full academic years work irrespective of the amount of pro tanto credit granted. (See Residence Requirements).

6) The University does not encourage the practice of students qualifying for several degrees at the Bachelor level. In no case will the University grant more than a second Bachelor's degree to one student without special review of the circumstances by University Council.

7) A student transferring from another university after a failed year will not be given credit for any of the courses in the failed year. If any of the courses in that year have been passed, he may, however, be allowed to substitute other courses for these instead of having to repeat them. (See Residence Requirements).

8) A student will not be given credit for courses taken in another university during the same academic term in which he has been registered for courses at Sir George Williams University, unless special permission has been obtained in advance from the Registrar.

9) No student may register for courses at Sir George Williams University if he is enrolled for concurrent university studies elsewhere.

10) Any student who has registered at Sir George Williams University and who wishes to take courses at another university for transfer of credit to Sir George Williams must have the courses approved by the Director of Admissions prior to enrolling for these courses. In addition, students enrolled in the Day Division who wish to take summer courses for credit at another institution, must first obtain the written permission of the appropriate Faculty Council.

11) A student may not apply transfer credits towards the residence years at the University unless special permission has been obtained from the appropriate Faculty Council. (See Residence Requirements).



## CORE REQUIREMENTS

Students who transfer from another University with a minimum of ten pro tanto credits are exempted from specific course requirements of the first and second years with the exception of the "core courses" listed below. However, such students must satisfy all other regulations for the degree.

### Bachelor of Arts

| | |
|---|---|
| 2 full credits in English Literature<br>or<br>2 full credits in French Literature | 2 |

### Bachelor of Fine Arts

Art 211, 231; 221 or 281, and all courses specifically required for the major selected by the student.

### Bachelor of Science

| | |
|---|---|
| First-year Mathematics (213 and 223). | 2 |
| 2 credits in first-year Science chosen from: | |
| Physics 211 | |
| Chemistry 211 | |
| Botany 211 and Zoology 222 | 2 |
| TOTAL | 4 |

### Bachelor of Commerce

| | |
|---|---|
| Mathematics 251 or 450 or 451 | 1 |
| Economics 211 | 1 |
| Economics electives | 2 |
| Accountancy 211 | 1 |
| Accountancy 411 or Finance 416 | 1 |
| Quantitative Methods 242 or Mathematics 441 | 1 |
| Quantitative Methods 411 | 1 |
| Management 211, 421, 430, 453 | 4 |
| Finance 413 | 1 |
| Marketing 421 | 1 |
| Sociology 211 | 1 |
| Psychology 211 | 1 |
| TOTAL | 16 |

# Residence Requirements

## RESIDENCE REQUIREMENTS

1. In addition to the specified courses, there is an additional requirement for any degree. A student must spend *at least* one full academic year at Sir George Williams University. This is interpreted as follows:

   In Arts, the final five credits.
   In Science, the final five credits.
   In Commerce, the final six credits.
   In Engineering, the courses of the final (fifth) year.

2. Any student who already possesses one degree must complete, at Sir George Williams University, a *minimum* of two additional years in order to earn a second degree at the Bachelor's level. This regulation applies whether the first degree was earned at Sir George Williams University or at some other university, and is interpreted to mean:

   All of the requirements as set out in the Announcement of the University for the "core" programme and the final two years of the specified degree, including among the courses taken, seven additional credits at the "B" or 400 level. (Arts or Science, at least 10 credits, of which 7 are B level; Commerce, at least 12 credits, of which 7 are B level; Engineering, all courses in 4th and 5th years).

3. Any student seeking to transfer to Sir George Williams University after having failed at another university or after having compiled an unsatisfactory record at another university must fulfill the residence requirements stipulated for him if he is admitted. In general, a *minimum* of two full academic years will be required for any degree.

## ACADEMIC YEAR

### Winter Session

The day and evening winter session of the University is divided into two terms of three and one-half months each. Dates marking the opening and closing of these terms are found on Page 4.

### Summer Session

A nine-week session is operated during the summer in the Evening Division for the convenience of Evening Division students only. It is recommended that those who take advantage of this session do so primarily to lighten their winter course load. Students are advised not to carry a programme through both winter and summer sessions,



unless at a reduced course load, for two consecutive summers. Students regularly enrolled in the Day Division may not take courses for credit in the summer session without permission of Faculty Council.

Engineering students must note, however, that only certain Science and elective courses may be taken in this way since courses in Engineering per se are not offered in this regular Summer Session.

### Special Summer Session

Courses in Applied Social Science, English, French, Geography, and Sociology and History are held during the day throughout the summer and are open to both Day and Evening Division students. For details regarding these courses, see Page 213.

## COURSE LOAD

### Winter Session

DAY DIVISION. Students in this division will carry five full courses in the first year. The remainder of the courses will be taken over the three following years with no more than six courses in any one year. However, students regularly registered in the Day Division must carry at least a four-credit course load. The course load for Engineering students is outlined on Page 184.

EVENING DIVISION. Students in this division will normally carry a maximum of three courses. The course load for Engineering students is outlined on Page 184.

NOTE:—A student with a deficiency may remove it by passing a supplemental examination. Under exceptional circumstances, a student may be permitted to make up a deficiency by taking an extra course during the regular session on written application to the Faculty Council for permission to do so.

### Summer Session

Students registered for courses offered in the regular Summer Session may not take more than two credits of work.

As indicated in the Summer Session time-table, some courses are designated as "maximum load" courses. Included in this category are all those listed at the '400' level, courses in English Literature, and courses which include a laboratory period or practice period. Students registered for one of these may not register for any other course.

An evening student who is accepted for courses in one of the Special Summer Sessions for a one-course programme may, if he wishes, register for a maximum of one credit of work in courses offered in the Summer Session.

Day students are reminded again that they may not register for courses offered in the Summer Session unless prior permission of Faculty Council has been granted.

## Special Summer Session (Day)

Students will ordinarily take one or one and one-half courses with two full credits being the maximum allowed in any circumstances. Further details may be found on Page 213.

# Faculty of Arts

## CURRICULUM FOR THE DEGREE OF BACHELOR OF ARTS

ADMISSION REQUIREMENTS: Requirements for admission to undergraduate standing in the Faculty of Arts are found on Page 49.

Students preparing for the degree of Bachelor of Arts will take 20 course credits as listed below. A full credit represents three hours of class work per week for a full academic year, with the required additional laboratory or studio work. A three-hour course followed for one term only is therefore a half-course and represents a half credit.

### First Year Arts (5 credits)

I. ONE credit selected from:
- Natural Science 210
- Physics 210, 211
- Chemistry 211
- Botany 211 and Zoology 222
- Mathematics

II. ONE credit: English 211*

III. ONE credit selected from:
- English 221*
- French 221, 222, 231

IV. ONE credit selected from:
- Humanities 210
- Philosophy 221
- Fine Arts
- a non-English language
- Religion
- Mathematics

V. ONE credit selected from:
- Social Science 210
- Psychology 211
- Economics
- Geography
- History
- Political Science
- Sociology

* *A student whose native language is not English should consult the statement on English requirements for non-English-speaking students on Page 48.*



### Second Year Arts (5 credits)

I. ONE credit selected from:
- Courses in the Faculty of Science. Recommended courses of general relevance are:
  - Natural Science 210, 231, 241
  - Biology 241
  - Physics 210
- Humanities 220
- Geography 221, 231, 232
- Psychology 211, 231, 241
- Sociology 241
- Quantitative Methods 242 (or Statistics 242)

II. ONE credit selected from:
- English Literature or French Literature. The language must be the same as that chosen under III in First Year.

III. ONE credit selected from: Humanities

IV. ONE credit selected from: Social Sciences

V. ONE credit selected from: any Faculty

### Third and Fourth Year Arts (5 and 5 credits)

Students must take ten further credits through the two years, with a maximum of six credits in any one year. At least six of these ten credits must be from the Humanities and/or Social Sciences.

At least seven of the total twenty credits required for the degree must be selected from courses at the "B" level (courses numbered in the 400's in the Announcement).

To be admitted to the third year, the student must have completed (or if an evening student, be in the process of completing) the requirements as outlined for the first and second years.

## CURRICULUM FOR THE DEGREE OF BACHELOR OF FINE ARTS

Students who fulfill the necessary requirements may transfer from the major in Fine Arts in the B.A. programme to the B.F.A. programme. Students applying for advanced standing from other universities will be evaluated individually on the basis of the programme of this University upon presentation of their transcripts and portfolio. Appointments for evaluation of the portfolio should be made for the first week of April or the week prior to registration.

Students in other faculties are encouraged to elect Fine Arts courses, and introductory courses will be specifically planned to include the non-Art major and the B.F.A. student.

Students preparing for the degree of Bachelor of Fine Arts will take 21 course credits as listed below. A full credit represents three hours of class work or six hours for studio work per week for a full academic year.

Students will be expected to complete a minimum of one hour of outside work per class hour.

### First Year Fine Arts (5 credits)

I. ONE credit selected from:
- Natural Science 210
- Physics 210, 211
- Chemistry 211
- Botany 211 and Zoology 222
- Mathematics

II. ONE credit: English 211*

III. ONE credit selected from:
- English 221*
- French 221, 222, 231

IV. ONE credit: Art 231

V. ONE credit selected from:
- Social Science 210
- Psychology 211**
- Economics
- Geography
- History
- Political Science
- Sociology

* *A student whose native language is not English should consult the statement on English requirements for non-English-speaking students on Page 48.*
***Required for Art Education Majors.*



### Second Year Fine Arts (5 credits)

I. ONE credit selected from:
- Courses in the Faculty of Science. Recommended courses of general relevance are:
  - Natural Science 210, 231, 241
  - Biology 241
  - Physics 210.
- Humanities 220
- Geography 221, 231, 232
- Psychology 211, 231, 241
- Sociology 241
- Quantitative Methods 242 (or Statistics 242).

II. ONE credit selected from:
- English Literature or French Literature. The language must be the same as that chosen under III in First Year.

III. ONE credit: Art 211

IV. ONE credit selected from: Social Sciences*

| | Painting Major | Sculpture Major | Graphics Major | Design Major | Art Education Major |
|---|---|---|---|---|---|
| V. | Art 410 | Art 221 | Art 281 | Art 490 | Art 221 or 281 or 410 |

### Third Year Fine Arts (6 credits)

| | Painting Major | Sculpture Major | Graphics Major | Design Major | Art Education Major |
|---|---|---|---|---|---|
| I. | Art 411 | Art 421 | Art 481 | Art 491 or 494 | Art 411 or 421 or 481 |

II. FIVE credits selected from the required and elective courses.

### Fourth Year Fine Arts (5 credits)

| | Painting Major | Sculpture Major | Graphics Major | Design Major | Art Education Major |
|---|---|---|---|---|---|
| I. | Art 412 | Art 422 | Art 482 | Art 493 | Art 412 or 422 or 482 |
| II. | Art 431 | Art 431 | Art 431 | Art 492 | Art 451 |

III. THREE credits selected from the required and elective courses.

**Education 211 required for Art Education Majors.*

### Required Courses (Third and Fourth Years)

| | Painting Major | Sculpture Major | Graphics Major | Design Major | Art Education Major |
|---|---|---|---|---|---|
| I. | Art 240 | Art 240 | Art 240 | Art 240 | Art 240 |
| II. | Art 243 | Art 243 | Art 243 | Art 243 | Art 243 |
| III. | Art 221 | Art 281 | Art 221 | Art 221 | Art 221 |
| IV. | Art 281 | Art 410 | Art 410 | Art 281 | Art 410 |
| V. | Art 490 | Art 490 | Art 490 | Art 410 | Art 490 |

### Elective Courses (Third and Fourth Years)

I. A selected studio course in Fine Arts at the 400 level.

II. A selected credit at the 400 level from any Faculty (Education 411 required for Art Education majors).

III. A selected credit from any Faculty, to be approved by the Department of Fine Arts.

## DEPARTMENT OF FINE ARTS

**Evening Non-Credit Programme 1967-68**

### Life Drawing

A course in drawing using various media. Quick sketches and long studies. This course stresses the development of personal interpretation.

### Painting

Painting in various media. The elements of picture making will be considered. Individual and personal development will be stressed.

### Sculpture

A basic course dealing with the elements and techniques of sculpture.

### Advertising Art

An introduction to advertising design, layout, lettering and the use of illustration. The various media, and technical knowledge of reproduction will be considered.



## MAJOR PROGRAMMES

A "major" is an approved *sequence* of at least six credits in a specific field, which may include certain approved courses in other closely related fields. The term "major" as used by Sir George Williams University implies that the student has followed, within the requirements for the degree, a planned programme in a specific field. The level of scholarship required is the same as that for the general degree.

Any student wishing to major must consult the chairman of the department concerned before planning a course sequence, and present to the Registrar a statement signed by the appropriate chairman, authorizing him to register for studies in the major field. It is recommended that such consultation take place during a student's second year, or before commencing the third year.

If necessary the requirements for a major may be completed after graduation.

### REQUIREMENTS FOR MAJORS

### Applied Social Science

The following courses, in an approved sequence, constitute a major in Applied Social Science:

A. Three credits chosen from Applied Social Science 221*, 231*, 241*, 251*, 411*, 431, 441*, 451*, 452*, 461*, 462*, 471.

B. Psychology 211; one credit chosen from Psychology 231, 441, 451.

C. Sociology 211; one credit chosen from Sociology 221*, 441*, 442*, 443*.

D. One additional credit chosen from Applied Social Science, Psychology, Sociology; Geography 211, 431, 441; Religion 221, 231, 414.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

### Canadian Studies

The following courses, in an approved sequence, constitute a major in Canadian Studies:

A. English 244, French 211, Geography 441, History 221.

B. At least three credits chosen from English 444*, Art 249*, 444, French 231, 431*, 432*, Religion 261, Economics 423*, 424, Education 231*, History 424, Political Science 251.

* *Half-course.*

C. Two courses with Canadian content chosen in consultation with the coordinator of the Canadian Studies programme.
D. Canadian Studies 411 to be taken in the fourth year.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the coordinator of the Canadian Studies programme.

## Classics

The following courses, in an approved sequence, constitute a major in Classics:

Greek 211, 212, 421.
Latin 211, 421; 422 or 423.
English 241*, Classics 211, Philosophy 221.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## Design

The following courses, in an approved sequence, constitute a major in Design:

Art 211, 231, 240, 410, 490; two credits chosen from Art 491, 492, 493, 494.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Department of Fine Arts.

## Drama

The following courses, in an approved sequence, constitute a major in Drama:

English 221, 253, 265, 437, 462*, 468.
Drama 212*, 247, 252, 455, 456.
Art 231.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Department of Fine Arts.

## Economics

The following courses, in an approved sequence, constitute a major in Economics:

Economics 211, 411, 421; 451 or 452; three and one-half additional credits chosen from among all Economics courses, Mathematics 251, Quantitative Methods 242 (or Statistics 242).

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

* *Half-course.*



## Economics and History

The following courses, in an approved sequence, constitute a major in Economics and History:

Economics 211, 221, 411, 421, 424; 451 or 452.

History 213, 251, 424; one credit chosen from History 431, 441, 456.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairmen of the departments of Economics and History.

## Economics and Mathematics

The following courses, in an approved sequence, constitute a major in Economics and Mathematics:

Economics 211, 411, 421; 451 or 452; 484*, 485*; one additional credit in Economics.

Mathematics 213 and 223 (or 233 by those qualified), 441, 451.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairmen of the departments of Economics and Mathematics.

## Economics and Political Science

The following courses, in an approved sequence, constitute a major in Economics and Political Science:

Economics 211, 411, 421; 451 or 452; one additional credit in Economics.

Political Science 211, 421, 431; two additional credits in Political Science.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairmen of the departments of Economics and Political Science.

## English

The following courses, in an approved sequence, constitute a major in English:

A. English 211, 221, 253.
B. At least four credits chosen from English 431, 434, 435, 436, 437, 454, 455.
C. The remainder of ten credits chosen from English 241*, 242*, 243*, 244, 261*, 444*, 445, 446, 447*, 453*, 461*, 462*, 463, 464*, 467, 468, 472, 481, 483.

**Half-course.*

One credit in a related field may be substituted for one of the credits required under C with the approval of the chairman of the department.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## French

The following courses, in an approved sequence, constitute a major in French:

A. French 211, 214.

B. French 221, 231, 422, 425, 426.

C. Two credits chosen from French 411, 412, 413*, 414, 421*, 423, 427*, 431*, 432*, 451, 461.

A student whose first language is French, and who is consequently not entitled to take French 211 or 214, will substitute two other courses in consultation with the chairman of the department.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## French and English Literature

The following courses, in an approved sequence, constitute a major in French and English Literature:

A. French 211, 214, 221, 423, 425, 426, 427*.

B. English 221, 253; three credits chosen from English 431, 434, 435, 436, 437, 445, 463.

C. Two credits chosen from French 231, 421*, 422, courses in English Literature other than those taken under B.

A student whose first language is French, and who is consequently not entitled to take French 211, will take either French 411 or another credit in French Literature in consultation with the chairman of the Department of French.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairmen of the departments of French and English.

* *Half-course.*



## French and Spanish

The following courses, in an approved sequence, constitute a major in French and Spanish:

A. French 211, 214; Spanish 211, 212.

B. French 221, 422, 425; two credits chosen from Spanish 421, 422, 423.

C. Two credits chosen from French 231, 411, 412, 413*, 421*, 423, 426, 427*, 431*, 432*, 461, the Spanish course not taken under B.

A student whose first language is French or Spanish, and who is consequently not entitled to take elementary language courses, will substitute other courses in consultation with the chairman of the Department of French.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Department of French.

## Geography

The following courses, in an approved sequence, constitute a major in Geography:

Geography 211, 231, 251, 261, 441, 461*; two additional credits in Geography.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## Graphics

The following courses, in an approved sequence, constitute a major in Graphics:

Art 211, 231, 240, 281, 410, 481, 482.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Department of Fine Arts.

## History

The following courses, in an approved sequence, constitute a major in History:

History 213; 251 or 261; one credit in Canadian History; two credits in History; one credit approved by the department chosen from History, Economics, English, Fine Arts, Geography, or Political Science. Three of the six credits must be at the "400" level.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

* *Half-course.*

## History and Philosophy of Religion

The following courses, in an approved sequence, constitute a major in the History and Philosophy of Religion:

A. Three credits chosen from Religion 213, 221, 231, 243, 251*, 252*, 261, 263.
B. Two credits chosen from Religion 411*, 412*, 413, 414.
C. Two credits chosen from Religion 443, 444, 462.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## Mathematics

The following courses, in an approved sequence, constitute a major in Mathematics:

Mathematics 450 or 451, 431, 411, 440 or 441; three and one-half additional 400-level credits in Mathematics, excluding Mathematics 442 and 446.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## Mathematics (Statistics Option)

The following courses, in an approved sequence, constitute a major in Mathematics (Statistics Option):

Mathematics 450 or 451, 431, 411, 441, 442, Computer Science 471*,
One of Mathematics 452, 457, 459.
One of Mathematics 444, 446.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## Painting

The following courses, in an approved sequence, constitute a major in Painting:

Art 211, 231, 240, 410, 411, 412; one additional credit in Fine Arts.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Department of Fine Arts.

* *Half-course*



## Philosophy

The following courses, in an approved sequence, constitute a major in Philosophy:

Philosophy 211, 221; four additional credits in Philosophy.

One credit from among the following may be substituted for one credit in Philosophy with the approval of the chairman of the department: History 211, Humanities 421, Political Science 431, Psychology 211, 412, Religion 444, Sociology 211.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## Political Science

The following courses, in an approved sequence, constitute a major in Political Science:

Political Science 211, 421, 431; three additional credits in Political Science.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## Psychology

The following courses, in an approved sequence, constitute a major in Psychology:

Psychology 211, 412; four additional credits in Psychology.

One credit from among the following may be substituted for one credit in Psychology with the approval of the chairman of the department: one credit in Biology, one credit in Education, Art 461, Psychology 241, Philosophy 211, 221, one credit in Sociology.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## Sculpture

The following courses, in an approved sequence, constitute a major in Sculpture:

Art 211, 221, 231, 240, 410, 421, 422.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Department of Fine Arts.

## Social Welfare

The following courses, in an approved sequence, constitute a major in Social Welfare:

A. At the introductory level: Economics 211, Political Science 211, Psychology 211, Sociology 211.

B. Two additional credits in Sociology and two additional credits in at least *one* of the other three fields named above.

C. Applied Social Science 461*, 462*; Psychology 241 or Sociology 241.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Department of Applied Social Science.

## Sociology

The following courses, in an approved sequence, constitute a major in Sociology:

Sociology 211; two additional credits in Sociology.
Anthropology 211, Psychology 211; Sociology 425 or Psychology 441.
One credit chosen from Economics 271, History 213, Political Science 411, Psychology 451, Sociology 241.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

## HONOURS PROGRAMME

The University has approved programmes leading to an Honours degree in certain selected fields. An Honours degree indicates specialization within a field, and high academic standing. In order to qualify for an Honours degree, a student must meet all of the academic qualifications and comply with the regulations set forth below.

1. An Honours student must maintain a "B" average with no grade lower than "C" in all courses in the basic Honours programme after the introductory course in the subject(s), and a passing grade in any additional courses that may be specifically required as part of the Honours programme. Such additional courses follow the phrase "in addition" in the descriptions of Honours programmes.

* *Half-course.*



2. An Honours student must obtain at least a "C" average over the total degree programme.

3. A student who fails *any* course shall be suspended from the Honours programme. He may be reinstated by the Honours Committee upon recommendation from the department(s) in which he is honouring.

4. An Honours student must meet the requirements for the general degree as well as the specific Honours requirements.

5. The normal point of entry into the Honours degree programme shall be at the beginning of the second academic year. (In the Evening Division, this shall be interpreted to mean at the beginning of the group of courses containing the seventh credit.) However, a student who has followed the courses prescribed for the second year of the Honours programme may be admitted to the programme at the beginning of the third academic year. (In the Evening Division, this shall be interpreted to mean at the beginning of the group of courses containing the twelfth credit.) Regular consultation and contact with the department(s) is an intrinsic part of an Honours programme. For this reason, no student may enter an Honours programme after the beginning of the third year, and no retroactive approval of entry may be made.

6. A student must complete two full years (not less than ten credits) at this University to meet the residence requirement for an Honours degree.

7. An evening student must complete the last ten credits of the Honours programme within five calendar years.

8. An Honours student shall consult with his department(s):
   (a) prior to being accepted into the Honours programme.
   (b) at the end of each year.

9. A student shall be allowed to qualify for only one Honours degree in one degree programme.

10. A student intending to undertake graduate work is strongly advised to include a second language in his undergraduate programme.

## REQUIREMENTS FOR HONOURS

### Economics

The following courses constitute an Honours programme in Economics, provided the student maintains the required academic standing:

Pattern A (for students in the Faculty of Arts).

First year: Economics 211.

Second year: Economics 411; Mathematics 251 (or 450 or 451).

Third year: Economics 452; Quantitative Methods 242 (or Statistics 242 or Mathematics 441).

Third and Fourth years: Economics 421; four and one-half additional credits chosen from among all Economics courses and Accountancy 211.

Pattern B (for students in the Faculty of Commerce).

First year: Economics 211; Mathematics 251 (or 450 or 451); Accountancy 211.

Second year: Economics 411; Quantitative Methods 242 (or Statistics 242 or Mathematics 441).

Third year: Economics 452.

Fourth year: Economics 421.

Third and Fourth years: Three and one-half additional credits in Economics.

### English

The following courses constitute an Honours programme in English, provided the student maintains the required academic standing:

A. English 221, 253, 431, 434, 435, 436, 437, 454.

B. English 467 or 472; 471*.

C. Three credits chosen from English 244, 261*, 444*, 445, 446, 447*, 453*, 455, 461*, 462*, 463, 464*, 468, 481, 483.

In addition, the following courses are required:

D. Candidates for Honours are required to take an approved modern or ancient language beyond the introductory level, or to pass during the second year a test in reading comprehension of a language approved by the English department. One of the following course combinations meets this requirement:

French 211, German 211 and 212, German 215, Greek 211 and 212, Latin 211, Russian 211 and 212, Spanish 211 and 212.

* *Half-course.*



The following sequence of courses is suggested for the Honours programmes:

First year: English 221.

Second year: English 253, one or two of English 244, 261*, 437, 445, 463.

Third and Fourth years: The remaining courses to complete the programme.

Candidates should begin to take the required language courses no later than the second year. Candidates are strongly advised to take History 431 early in the programme.

### French

The following courses constitute an Honours programme in French, provided the student maintains the required academic standing:

First year: French 211.

Second year: French 214, 221.

Third and Fourth years: French 411, 412, 422, 425, 426, 451. Three credits chosen from French 231, 413*, 414, 421*, 423, 427*, 431*, 432*, 461.

A student whose first language is French, and who is consequently not entitled to take French 211 or 214, will substitute two other courses in consultation with the chairman of the department.

A student preparing for graduate work in French is advised to study Latin during his undergraduate programme.

### Geography

The following courses constitute an Honours programme in Geography, provided the student maintains the required academic standing:

First and Second years: Geography 211, 231, 251.

Second or Third years: Geography 261.

Third and Fourth years: Geography 411, 421, 441, 461*, 491; three additional credits in Geography.

* *Half-course.*

It is strongly recommended that an Honours student in Geography planning to do graduate work acquire a good reading knowledge of a modern language related to his field of interest.

An Honours student will be required to meet with a faculty advisor and to participate in field trips as arranged by the department.

## History

The following courses constitute an Honours programme in History, provided the student maintains the required academic standing:

Pattern A (emphasizing History of the Americas).

First year: History 213.
Second year: History 221, 251.
Third year: History 472.
Fourth year: History 471.
Third and
Fourth years: History 261 and 425*. Three and one-half credits chosen from History 422, 423, 424, 426, 452, 453, 454*, 455, 456, 457*, 458*, of which at least one credit must be in Canadian History.

One credit in a related subject may be substituted for one of the credits specified above, with the approval of the chairman of the department.

It is strongly recommended that an Honours student in History planning to do graduate work acquire a good reading knowledge of a modern language. For History of the Americas, French or Spanish is recommended.

Pattern B (emphasizing European and World History).

First year: History 213.
Second year: History 261. One credit chosen from History 414, 415, 416.
Third year: History 472.
Fourth year: History 471.
Third and
Fourth years: History 251 and 433*. Three and one-half credits chosen from History 413*, 414, 415, 416, 431, 432*, 441, 442, 461, 462*, 481.

One credit in a related subject may be substituted for one of the credits specified above, with the approval of the chairman of the department.

* *Half-course.*



It is strongly recommended that an Honours student in History planning to do graduate work acquire a good reading knowledge of a modern language. For European and World History, French, German, Russian or Spanish is recommended.

## Mathematics

The following courses constitute an Honours programme in Mathematics, provided the student maintains the required academic standing:

Pattern A (for students entering without Intermediate Algebra and Trigonometry, or entering second year).

First year: Mathematics 213, 223.
Second year: Mathematics 411, 431, 451. (Properly qualified students entering second year will replace Mathematics 451 by 450).
Third year: Mathematics 441, 452, 458, 459.
Fourth year: Mathematics 461, 462, 463.
Third or
Fourth years: Computer Science 471*, Mathematics 481*.

Pattern B (for students entering with Intermediate Algebra and Trigonometry).

First year: Mathematics 233, 451.
Second year: Mathematics 411, 431, 452.
Third year: Mathematics 441, 458, 459.
Fourth year: Mathematics 461, 462, 463.
Third or
Fourth years: Computer Science 471*, Mathematics 481*.

## Mathematics (Statistics Option)

The following courses constitute an Honours programme in Mathematics (Statistics Option), provided the student maintains the required academic standing:

Pattern A (for students entering without Intermediate Algebra and Trigonometry, or entering second year).

First year: Mathematics 213, 223.
Second year: Mathematics 411, 431, 451. (Properly qualified students entering second year will replace Mathematics 451 by 450).
Third year: Mathematics 441, 452, 458, 459, Computer Science 471*.
Fourth year: Mathematics 442, 448. Two credits chosen from Mathematics 444, 446, 461, 462.

* *Half-course.*

Pattern B (for students entering with Intermediate Algebra and Trigonometry).

First year: Mathematics 233, 451.

Second year: Mathematics 411, 431, 452.

Third year: Mathematics 441, 458, 459, Computer Science 471*.

Fourth year: Mathematics 442, 448. Two credits chosen from Mathematics 444, 446, 461, 462.

Note: (a) Students intending to go on to graduate work in Statistics should elect Mathematics 461 and 462 in fourth year.

(b) Students intending to go on to graduate work in Operations Research should elect Mathematics 444 and 462 in fourth year.

(c) Students desiring a more applied programme should elect Mathematics 444 and 446 in fourth year.

### Political Science

The following courses constitute an Honours programme in Political Science, provided the student maintains the required academic standing:

First year: Political Science 211.

Second year: Political Science 251, 421.

Third year: Political Science 431.

Fourth year: Political Science 432, 491.

Third and Fourth years: Political Science 441. Three credits chosen from Political Science 411, 413*, 414*, 415, 416*, 417*, 422, 433, 451*.

One credit in Economics, Sociology, Geography, or History may be substituted for one of the credits specified above, with the approval of the chairman of the department.

It is strongly recommended that an Honours student in Political Science planning to do graduate work acquire a good reading knowledge of a modern language, and take Political Science 433.

### Psychology

The following courses constitute an Honours programme in Psychology, provided the student maintains the required academic standing:

First and Second years: Psychology 211, Botany 211*, Zoology 222*, Philosophy 211 or 221. (The Biology or Philosophy courses may be taken in third year, if necessary.

* *Half-course.*



Second year: Psychology 241.

Third year: Psychology 412, 461, 471.

Fourth year: Psychology 472; two additional 400-level credits in Psychology.

In addition, Sociology 211, to be taken in any year.

It is strongly recommended that an Honours student in Psychology planning to do graduate work acquire a good reading knowledge of French, German, or Russian.

### Sociology

The following courses constitute an Honours programme in Sociology, provided the student maintains the required academic standing:

First and Second years: Sociology 211, Anthropology 211, Psychology 211. (Anthropology 211 or Psychology 211 may be taken in third year, if necessary). In addition, Sociology 241 in second year.

Third and Fourth years: Sociology 411, 422, 423 or 424, 491; Psychology 441 or Sociology 425; one additional credit in Sociology.

In addition, one credit, approved by the department, in a social science other than Sociology, Anthropology, or Psychology, to be taken in any year.

It is strongly recommended that an Honours student in Sociology planning to do graduate work acquire a good reading knowledge of French or German.

## GRADUATE PROGRAMMES

Courses of study leading to the degree of Master of Arts are offered in Art Education, Economics, English and History. Courses are given in the late afternoon and evening, making it possible for both day and evening students to attend.

### Residence Requirements

The minimum residence requirement for the completion of the degree is one full year's academic work as defined for each degree. This requirement must be met regardless of the amount of graduate work previously completed in any other programme or at any other university. The work for the degree must be completed within a period of five years from admission.

A full-time student is not permitted to engage in employment not directly related to his academic programme for more than ten hours per week. This includes teaching, demonstrating, marking, or

work outside the university. A student who exceeds this amount of work must register as a part-time student.

### Financial Assistance

The Provincial Government offers scholarships for graduate work in Arts and teacher training. In addition, various departments in the University offer salaries for teaching assistance, demonstrating, and marking. The amount of salary paid varies from department to department and depends upon the amount of work involved. Students who are interested in obtaining assistance should inquire from the department concerned.

## MASTER OF ARTS IN ART EDUCATION

### Admission

To qualify for admission a candidate should have a Bachelor of Fine Arts degree, or a B.A. with specialization in art, or the equivalent, and desirably, have attained a "B" average in Fine Arts subjects. Undergraduate courses must have included:

2 full courses in Art Education
2 full courses in the History and Philosophy of Education
1 full course in Psychology

In addition, the candidate must have had some experience in the teaching of art prior to admission to the programme.

### General Requirements

1. A fully qualified candidate must select five courses, chosen in consultation with his advisory committee.
2. Students who do not have a background in statistics sufficient for the reading of research abstracts may find it necessary to attend a short orientation course.
3. In addition to the five courses, a thesis is required. The topic for the thesis will be selected by the student in consultation with his advisor and will be based on the seminars, studio work, and personal interests. It must contribute in some way to knowledge and must display good literary form. Three copies must be submitted by the student at least two months before the convocation at which the degree is to be conferred. Two copies of the thesis will be deposited in the library and the third copy will be given to the research director after the thesis has been approved by the examiners.
4. Each student will be required to hold an exhibition of his work upon completion of the studio courses at a time to be decided upon by the student and his advisor.



### Courses

Five full courses, a thesis and an exhibition of the candidates studio work are required.

Students are expected to concentrate their efforts in one studio area (major in Painting, Graphics or Sculpture) and to support their major work in another studio area (minor in Painting, Graphics or Sculpture).

Candidates must choose two studio courses from the following:

**631 - Art 511. Graduate Painting**

This course assumes the mature and competent handling of painting media, and a thorough knowledge of the history of art in relationship to style, content and aesthetics.

**631 - Art 521. Graduate Sculpture**

The student will study traditional and experimental media and develop themes based upon a personal integration of the history of sculptural form and contemporary media. Work of a mature nature will be expected.

**631 - Art 581. Graduate Graphics**

The student will be required to have a thorough knowledge of the history and aesthetics of the graphic media. Integration of traditional and contemporary experimental usages of graphics will be expected.

**The following are required for all candidates:**

**631 - Art 551. Graduate Seminar and Workshop in Art and Education**

A seminar in which the contents of all other courses are analysed and discussed in terms of their implications for the teaching of art. Topics will include art history, the nature of the creative process, the role of art in society, the nature of child art, the aesthetic development of the individual, and the learning process in the studio. Students will identify and investigate problem areas requiring research.

The workshop is a flexible arrangement set up according to the needs of the participants in the seminar, in which the students will be able to explore various art media and ideas related to their research projects.

**706 - Psychology 591. Seminar**

A seminar led by members of the Psychology department and invited participants to deal with:

Learning Theories
Motivation
The Creative Process
Cultural Factors Affecting Taste and Art

**702 - Education 591. Seminar in Education**

The history and philosophy of education in the context of contemporary cultures, and selected studies of relevant programmes of education.

# MASTER OF ARTS IN ECONOMICS

## Admission

The requirements for admission is an Honours degree in Economics or its equivalent. Applicants with deficiencies in their undergraduate programme may be required to undertake a number of selected courses to meet the minimum requirements.

Each student accepted will work under the supervision of an advisor, a member of the department.

## General Requirements

1. A minimum of one academic year for full-time students and two years for part-time students. A full-time student must take a minimum of two and one-half courses during a given year. A part-time student may take a maximum of two courses in a given period.
2. Each student must complete two compulsory full courses, and one optional (half) seminar from among those offered.
3. In addition to the fulfillment of the course requirement, each student must complete a research paper, under the guidance of a member of the department. The topic for the thesis is subject to approval by the Research Committee of the department. Each completed thesis will be graded by the student's thesis advisor and at least one other examiner. The latter may be a specialist from outside the department or the University.
4. A comprehensive examination must be taken in micro economics, macro economics, and one other selected area. The comprehensive examination conducted by a special examining board may be either oral or written. The examination board will consist of at least three members of the department in addition to the student's supervisor.

## Courses

Each student must complete the two following compulsory courses, plus one optional (half) seminar from among those listed:

**701 - Economics 610. Micro Economics**

A course in micro economics which will solidify, and enlarge the scope of, the student's undergraduate training. Early and contemporary contributors to micro economic theory are studied. Modern analysis is applied in a critique of some aspects of the history of economic thought. Traditional and modern formulation of consumer behaviour theory, the theory of the firm, the theory of markets and welfare economics are studied. Methodological problems in economic theory, and in particular, the distinction between dynamic and static analysis, is stressed. Some modern techniques of analysis are covered. For example, in the theory of the firm, 'linear programming' and 'decision theory', and 'input-output' analysis is included as part of the theory of markets. (Full course).



**701 - Economics 650. Macro Economics**

An advanced treatment of modern macro economic theory and policy. Attention will be paid to dynamic and expectational models and their relevance to current problems. Recent empirical findings and post-war economic policy will also be considered in the course. (Full course.)

### OPTIONAL SEMINARS

**701 - Economics 625. Seminar on Economic Growth**

A theoretical analysis of the process and problems of economic development such as capital accumulation, choice of technology, investment criteria, and foreign aid. (Half course.)

**701 - Economics 665. Seminar on International Trade**

Classical and general models of international trade. Classical comparative cost theory and the Heckscher-Ohlin model. Inter-regional and inter-group trade, and the pure theory of exchange. Factor movements, prices, and supplies, and the opportunity—cost real—cost controversy revisited. Offer curves from Marshall to Meade. Welfare analysis in foreign trade theory. (Half course.)

**701 - Economics 675. Seminar on Labour Economics** (not offered in 1967-68)

**701 - Economics 685. Seminar on Mathematical Economics**

An investigation of some areas of economic theory by mathematical techniques. In particular, calculus, complex variables, difference and differential equations, control theory, matrix algebra, theory of games and linear programming are studied and used. Some areas in which the mathematical tools are applied are the theory of value, the theory of the firm, resource allocation, general equilibrium, business cycles, and growth models. The course concentrates on the teaching of the mathematical tools and their application in economics. (Half course.)

**701 - Economics 695. Seminar on Axiomatic Choice Theory**

Development of a formalized theory of choice since the early work of Arrow. General axioms of choice theory. Special axioms, continuity and other assumptions for special purposes. Contributions of Debreu, Newman, Putnam and others. Incomparability and other unsettled issues. (Half course.)

# MASTER OF ARTS IN ENGLISH

## Admission

The requirement for admission is an Honours degree in English or its equivalent. Each candidate must write a comprehensive entrance examination before final acceptance. The department may require anyone with deficiencies in his undergraduate programme or in part of the entrance examination to undertake a number of reading courses in selected areas of English literature.

Each student accepted will work under the supervision of an advisor who, with two other members of the staff, will constitute the student's advisory committee.

## General Requirements

1. A fully qualified candidate must select four courses, chosen in consultation with his advisory committee.
2. A candidate who is deficient in one or two required undergraduate courses will undertake reading courses in these fields.

3. Each student must demonstrate his ability to read an ancient or modern language other than English. The test will be supervised by his advisory committee, who is also responsible for ensuring that the language chosen is relevant to the student's academic programme.

4. A comprehensive examination must be taken near the end of the programme.

5 Each student will be required to submit a thesis (roughly thirty to forty thousand words in length) on a topic chosen in consultation with the advisory committee. Three copies of the thesis must be submitted by the student at least two months before the convocation at which the degree is to be conferred. Two copies of the thesis will be deposited in the library and the third copy will be given to the research director after the thesis has been approved by the examiners.

## Courses

**English 611. Department Seminar**
Special Subject, 1967-68:
Literary Study and Modern Culture

**English 623. Studies in Renaissance Literature**

**English 624. Studies in Eighteenth Century Literature**

**English 625. Studies in Nineteenth Century Literature**
Special subject, 1967-68:
Byron, Shelley, Keats

**English 631. Studies in Poetry**

**English 632. Studies in Drama**

**English 633. Studies in Fiction**
Special Subject, 1967-68:
Defoe, Richardson, Fielding and Sterne

**English 635. Studies in the History of Ideas**

**English 641. Studies in Shakespeare**
Offered 1967-68

**English 642. Studies in American Literature**
Special Subject, 1967-68:
American Poetry since 1945

**English 643. Studies in Canadian Literature**

**English 650. Literary Criticism**
Offered 1967-68



**English 651. Seminar:** Section A
Special Subject, 1967-68:
Tragedy
Section B
Special Subject, 1967-68:
Yeats and Joyce

**English 653. Anglo-Saxon**
Offered 1967-68

N.B. Courses listed for 1967-68 are tentative, and may change without notice.

# MASTER OF ARTS IN HISTORY

The Department of History offers two graduate programmes for the Master's degree. Pattern I is designed for teachers whose primary interest is to broaden their knowledge in order to improve the effectiveness of their classroom instruction. Pattern II is more specifically directed towards advanced research and further graduate work.

## Admission

The requirements for admission are as follows:

Pattern I—B.A. degree with satisfactory standing and adequate specialization in history. Students will be required to make up any deficiencies in their undergraduate preparation.

Pattern II—Honours degree in History, or its equivalent. Students will be required to make up any deficiencies in their undergraduate preparation.

## General Requirements

Pattern I (without thesis)

1. A fully qualified candidate is required to take five seminars, as follows:

**History 673. Methodology of Historical Studies**
**History 525. Readings in Selected Areas of History**
**History 613. Problems in Modern European History**
**History 621. Problems in Canadian History***

One of the following:

**History 651. Problems in United States History**
**History 661. Problems in Modern Asian History**
**History 691. Problems in the History of a Selected Area.**

* *Students in this course are required to have a reading knowledge of both French and English.*

2. Each student must take a comprehensive oral examination before a committee of the department, designed to test his mastery of the fields of history covered in the four seminar courses and the reading course in his programme of study.

Pattern II (with thesis)

1. The student must demonstrate his ability to read and translate historical material in an acceptable modern language other than English.

2. A fully qualified candidate is required to take three seminars, as follows:

**History 671. Philosophy of History****

Two of the following:

**History 613. Problems in Modern European History**
**History 621. Problems in Canadian History***
**History 651. Problems in United States History**
**History 661. Problems in Modern Asian History**
**History 691. Problems in the History of a Selected Area**

3. Students needing supplementary preparation in a particular field of history will also be required take **History 525. Readings in Selected Areas of History.**

4. Each student will be required to submit a thesis on a topic approved by the research committee of the department, taking into consideration:
   inherent validity of the proposed topic,
   availability of competent supervision,
   available sources.
   Each thesis shall be read and graded by the student's thesis director and by two other scholars, one of whom may be an outside examiner.

5. Each student must take a comprehensive oral examination before a committee of the department, designed to test:
   his ability to defend his thesis,
   his special knowledge of the field in which his thesis falls.

** *Students who have a course in the philosophy of history on the undergraduate level may be excused from this course.*

* *Students in this course are required to have a reading knowledge of both French and English.*



# FACULTY OF ARTS

John W. O'Brien, *Dean.*
Mervin Butovsky, *Assistant Dean.*

NOTE:—Courses which are no longer offered and those whose titles and course numbers have been changed are listed on Page 264.

## HUMANITIES DIVISION

William R. Fraser, *Senior Professor.*

### HUMANITIES

Rachel Wasserman, *Professor of Humanities.*

**600 - Humanities 210. General Course in the Humanities**
It is the purpose of this course to enlarge and enrich the student's comprehension of his cultural heritage by the study of Man as a unique creative being. The sources for this study of man are drawn primarily from the fields of history, philosophy, religion, literature and the arts with a view toward examining those experiences and ideas of enduring power which have shaped the nature of the modern man from the age of Greece to the present century. (Full course.)

**600 - Humanities 220. Science and Society**
Prerequisite: second-year standing. A course designed to acquaint the student in the Faculty of Arts with the impact of science on society. (Full course.)

**600 - Humanities 421. Twentieth Century Humanism**
Prerequisite: Philosophy 211 or 221, or other approved courses. Modern authors and philosophers are studied and discussed in an attempt to discover the trend of humanistic thinking in the present century. Particular emphasis is placed on global thinking, the effect of modern conditions on contemporary thought. (Full course.)

### CLASSICS

Paul Widdows, *Associate Professor of Classics, and Chairman of the Department.*
Charles R. Barton, *Assistant Professor of Classicss and Linguistics.*

#### *ANCIENT HISTORY*

**614 - Classics 211. History of Greece and Rome**
A political, cultural and social history of Greece and Rome from the Mycenaean Age to the Fall of the Roman Empire, with special emphasis on fifth century Athens and Rome of the Republic and Early Empire. (Full course.)

#### *GREEK*

**605 - Greek 211. Introductory Course in Greek**
The purpose of this course is to enable a student, in one year, to gain an adequate knowledge of Greek grammar and syntax and to read simple passages of Greek quickly and accurately. (Full course.)

**605 - Greek 212. Greek Language and Literature**
The purpose of this course is to complete the study of Greek grammar and syntax begun in Greek 211, and to enable students to begin reading Greek authors. A book of Xenophon or Herodotus and the Gospel of St. John will be read. (Full course.)

### 605 - Greek 421. Greek Literature

This is essentially a reading course involving the study of certain of the great works of Greek literature. The books to be read are the Gospel of St. Mark, a book of Homer, and a Greek play. It is assumed that students taking this course have an adequate knowledge of Greek grammar and a fair vocabulary. (Full course.)

### 605 - Greek 422. Greek Literature

A further study of Greek literature (to follow Greek 421) including a play by Sophocles, a book by Thucydides and a book by Plato. (Full course.)

## *LATIN*

### 608 - Latin 201. Beginners' Latin

This course is designed for students who have had no previous Latin and is particularly recommended for those students who wish to be prepared for Latin 211. The course offers instruction in Latin grammar, translation and prose composition. (Full course.)

NOTE:—Students who have received credit toward their admission for high school Latin may not take this course for credit.

### 608 - Latin 211. Latin Composition and Translation

Instruction in Latin prose composition and syntax with practice in sight translation. The course also includes translation and literary interpretation of prescribed selections from the Latin classics in poetry and prose. (Full course.)

### 608 - Latin 421. Latin Literature

The purpose of this course is to provide students, interested in the subject, with a wider and deeper knowledge of the Roman people, their history, life and literature, by the reading of selected works of the best known Latin writers of the Late Roman Republic and the Early Roman Empire. (Full course.)

### 608 - Latin 422. Latin Literature (Advanced)

A continuation of Latin 421, concentrating on a particular period or the works of a particular author, e.g. Juvenal and Tacitus, or Lucretius. (Full course.)

### 608 - Latin 423. Latin Literature

A parallel course to Latin 422, covering different authors, e.g. Latin Comedy, Latin Elegists or Horace. As Latin 422 and Latin 423 will not usually be given in the same year, Latin 423 may be taken before Latin 422. (Full course.)

## *LINGUISTICS*

### 615 - Linguistics 211. Introduction to Linguistics

Prerequisite: one credit in a language other than English. The course is divided into two halves: Descriptive Linguistics and Comparative Indo-European Linguistics. Descriptive Linguistics will enable the student to become familiar with the basic elements which underlie all languages and will acquaint him with a number of varied linguistic patterns, with emphasis on the analysis of languages with structural features which differ widely from those ordinarily encountered. Comparative Indo-European Linguistics will enable the student to understand in depth the meaning of "related" languages, by a study of Sanskrit, Greek, Latin, the Romance languages, Germanic, Slavic and the English language. (Full course.)



## ENGLISH

Neil Compton, *Professor of English, and Chairman of the Department.*
Douglass Burns Clarke, *Professor of English and Fine Arts*
Rachel Wasserman, *Professor of Humanities.*
Wynne Francis, *Associate Professor of English.*
Sidney Stevens Lamb, *Associate Professor of English.*
Lorna Elizabeth MacLean, *Associate Professor of English.*
Rytsa Tobias, *Associate Professor of English.*
Henry E. Beissel, *Assistant Professor of English.*
Roslyn Belkin, *Assistant Professor of English.*
Michael Brian, *Assistant Professor of English.*
Audrey Bruné, *Assistant Professor of English.*
Mervin Butovsky, *Assistant Professor of English.*
Howard R. Fink, *Assistant Professor of English.*
Malcolm Foster, *Assistant Professor of English.*
Michael M. Gnarowski, *Assistant Professor of English.*
Stanton de Voren Hoffman, *Assistant Professor of English.*
David B. McKeen, *Assistant Professor of English.*
Abraham Ram, *Assistant Professor of English.*
Gary J. Scrimgeour, *Assistant Professor of English.*
G. David Sheps, *Assistant Professor of English.*
Richard J. Sommer, *Assistant Professor of English.*
Anne M. Stokes, *Assistant Professor of English.*
Gwendoline Pilkington, *Sessional Lecturer in English.*
Irving Layton, *Poet in Residence.*

### 601 - English 200. English Language

A non-credit course for students whose first language is other than English, designed to raise the student's level of expression to a standard which will enable him to work efficiently at the University. This course is offered as a one-term course, but the student will remain in English 200 until, in the opinion of the instructor, he is able to express himself clearly and coherently. Once the student has passed English 200, he will not have to take English 201 or English 211 although he may later elect to take these courses for credit.

### 601 - English 201. English Language and Composition

Prerequisite: English 200, or exemption from English 200. This course is designed for students who have completed secondary school or the equivalent in a language other than English and for whom, therefore, English is a secondary tongue. (Full course.)

NOTE:—Students who have credit for English 211 may not take this course for credit.

### 601 - English 211. College Composition

This course encourages the development, through practice in the skills of writing, of an effective prose style, to enable the student to work effectively at the college level and beyond. (Full course.)

### 601 - English 215. Public Speaking

Prerequisite: English 211. The aim of this course is to develop in the student the ability to express himself more effectively in everyday life, as well as to give practice in speaking before groups of people. (Half course.)

### 601 - English 216. Public Speaking, Advanced

Prerequisites: English 211, 215. Students in this course will be trained in the preparation and delivery of major speeches and lectures, during which they will be subject to questioning of the type to be expected in normal speaking engagements. (Half course.)

### 601 - English 219. Creative Writing (Prose)

Prerequisite: English 211. A study of the creative and technical problems of the short story; analysis and criticism of the student's own work. (Full course.)

### 601 - English 221. Introduction to English Literature

This first-year course studies the development of English literature from Chaucer to the present through the examination of individual works and their social background. Students are expected to attend regular conferences in addition to the lectures. (Full course.)

### 601 - English 222. Literature and the Modern World

Intended primarily for students in Science or Commerce, this introductory course is devoted mainly, although not exclusively, to a study of the literature of this century. Students are expected to attend regular conferences in addition to the lectures. (Full course.)

NOTE:—This course is not an acceptable prerequisite for most advanced English courses.

### 601 - English 241. World Literature—Classical

Through the medium of the best English translations, this course attempts to give the student a clear knowledge and appreciation of the great masterworks of thought and expression that are an important part of his cultural heritage from the Ancient World. (Half course.)

### 601 - English 242. World Literature—Medieval

A course complementary to English 241, which explores, through the reading of modern English versions, the literary heritage of the middle ages from Boethius to Dante; writings of the early Christian Church; Irish, Old English, Romanesque Arthurian, Teutonic, Romance, and Late Latin Literature. (Half course.)

### 601 - English 243. World Literature—Modern

A course complementary to English 241, which attempts to extend the literary experience of the student beyond the confines of his mother tongue, and of those secondary languages which he is ordinarily able to learn. Through the medium of the best English translations, a study will be made of the outstanding literature of other modern languages, including the French, German, Russian, Italian, Spanish, and Scandinavian. (Half course.)

### 601 - English 244. Canadian Literature

Prerequisite: English 221 or 222. This course provides for the study of Canadian prose and poetry written in or translated into English. Particular emphasis is placed upon contemporary writers. (For a similar and complementary course in French, see French 231.) (Full course.)

### 601 - English 253. Shakespeare

Prerequisite: English 221. A study of Shakespeare's achievements as dramatist and poet, and the relationship of his work to the social and literary traditions of his day. Shakespeare's work as a whole will be surveyed in some detail: close attention will be paid to some five or six plays and to the Sonnets. (Full course.)



### 601 - English 261. Introduction to Poetry

Prerequisite: English 221. A study of the principles of poetry and its forms with special emphasis on the reading and analysis of all types of poetry with a minimum of historical and biographical detail. (Half course.)

### 601 - English 265. Introduction to European Drama

Prerequisite: English 221. A study of the European dramatic tradition from the beginning of Greek tragedy to the end of the nineteenth century. (Full course.)

### 601 - English 411. Advanced Composition

Prerequisite: English 211 with grade of C or above. English 411 is offered to those students who wish to continue in a writing course in order to gain greater effectiveness in composition for general purposes. (Full course.)

NOTE:—Students who have credit for English 212 may not take this course for credit.

### 601 - English 418. Creative Writing (Poetry)

Prerequisites: English 211, 221, 261 or permission of the instructor. This course offers advice and a critical reading of their work to advanced students with a special interest and ability in written expression. (Full course.)

NOTE:—This course is open to undergraduates only.

### 601 - English 419. Advanced Creative Writing (Prose)

Prerequisites: English 211, and permission of the instructor. This course offers advice and a critical reading of their work to advanced students with a special interest and ability in written expression. (Full course.)

NOTE:—This course is open to undergraduates only. Beginning in 1968-69, the prerequisites for this course will be English 211, 219 or permission of the instructor.

### 601 - English 431. Literature of the English Renaissance

Prerequisites: English 221, 253. A study of English literature from Wyatt to Marvell. (Full course.)

NOTE:—Only two full credits will be given from among English 431, 432, 433, and 468.

### 601 - English 434. English Literature of the Restoration and 18th Century

Prerequisites: English 221, and one additional credit in English Literature. A study of English literature from 1660 to 1780. (Full course.)

### 601 - English 435. English Literature of the Romantic Period

Prerequisite: English 221. A study of prose and poetry from Blake to Keats. (Full course.)

### 601 - English 436. Victorian Literature

Prerequisite: English 221. A study of the works of major writers in England from 1830 to 1900. (Full course.)

### 601 - English 437. Modern British and American Literature

Prerequisite: English 221. A study of literature in English since 1900. (Full course.)

### 601 - English 444. Canadian Literature (Advanced)

Prerequisites: English 221 or 222, 244. A study at a more advanced level than is possible in English 244 of a limited number of major Canadian writers. (Half course.)

NOTE:—This course will also be given as a full credit in the Special Summer Session in English, 1967.

### 601 - English 445. American Literature

Prerequisite: English 221. A study of American prose and poetry from colonial times to the twentieth century. (Full course.)

### 601 - English 446. Modern European Literature

Prerequisites: English 221, and one additional credit in literature. A study of the work (in translation) of major European writers from 1880 to the present. (Full course.)

### 601 - English 447. American Literature (Advanced)

Prerequisites: English 221, 445. A limited aspect of American literature will be studied intensively. (Half course.)

### 601 - English 453. Shakespeare (Advanced)

Prerequisites: English 221, 253. An advanced study of a limited number of plays. (Half course.)

### 601 - English 454. Chaucer and his Contemporaries

Prerequisites: English 221, and one additional credit in English Literature. A study of the work of Chaucer and a few of his major contemporaries. (Full course.)

### 601 - English 455. Spenser and Milton

Prerequisites: English 221, 253. A study of the works of Edmund Spenser and John Milton. (Full course.)

### 601 - English 461. Modern Poetry

Prerequisites: English 221, 437. A study of the works of major poets in the English language in the twentieth century. (Half course.)

### 601 - English 462. The Modern Drama

Prerequisites: English 221, 437. A study of the evolution of modern drama. Emphasis will be placed upon the plays of Ibsen, Shaw, and subsequent dramatists. (Half course.)

NOTE:—Students who have credit for English 262 may not take this course for credit.

### 601 - English 463. The English Novel

Prerequisite: English 221. A study of the origin and development of the English novel to the end of the nineteenth century with special emphasis on readings from Defoe to Henry James. (Full course.)

### 601 - English 464. Modern Fiction

Prerequisites: English 221, 437. A study of the types, techniques, and themes of modern prose fiction. (Half course.)



### 601 - English 467. Literary Criticism

Prerequisites: at least three credits in literature. This course offers both a history of literary criticism from antiquity to the present and studies in the practice of the best contemporary critics. (Full course.)

NOTE:—Only one full credit will be given from among English 467, 465 and 466.

### 601 - English 468. English Renaissance Drama

Prerequisites: English 221, 253. A study of the English drama in the 16th and 17th centuries. (Full course.)

NOTE:—Only two credits will be given from among English 431, 432, 433, and 468.

### 601 - English 471. Honours Essay

Prerequisite: open to fourth-year Honours students, or by permission of the department. A scholarly or critical essay of about 7,500 to 10,000 words on a subject to be chosen in consultation with the department. The student's work will be supervised by a faculty member. (Half course.)

### 601 - English 472. Advanced Seminar in a Special Subject

Prerequisite: permission of the department. This course, intended for senior students with a good background of English courses, is designed to provide an opportunity for cooperative study and discussion of literature at a more advanced level than the normal lecture course will allow. It is taught, from year to year, by different members of the English department, and the subject itself changes in order to take advantage of the seminar leader's special talents and current interests. (Full course.)

NOTE:—With the permission of the department, a student may take this course twice for credit, provided that a different subject is dealt with the second time. He will register the second time under English 473.

Special subjects for 1967-68: Tragedy.
Yeats and Joyce.

### 601 - English 473. Advanced Seminar in a Special Subject

Prerequisite: permission of the department. A student repeating English 472 a second time registers for credit under English 473. (Full course.)

### 601 - English 474. Literature and Society

Prerequisites: English 221; 436 or 437. Through a study of English literature from 1890-1920, this course aims to illustrate the general ways in which the social and literary developments in a particular period are interrelated, and to explore the sort of relationship that the work of a number of particular and quite different writers bears to the social background. (Full course.)

NOTE:—This course will be given *only* in the Special Summer Session in English, 1967.

### 601 - English 481. Anglo-Saxon

Prerequisites: at least three credits in English Literature. A study of language and literature in the Anglo-Saxon era. (Full course.)

### 601 - English 483. Middle English

Prerequisites: English 221, 253. A study of the language and literature of England from the twelfth to the fifteenth century (excluding Chaucer). (Full course.)

### Cognate Course

See also **Linguistics 211. Introduction to Linguistics.**

## FINE ARTS

Alfred Pinsky, *Associate Professor of Fine Arts, and Chairman of the Department.*
Douglass Burns Clarke, *Professor of English and Fine Arts.*
Edwy F. Cooke, *Associate Professor of Fine Arts.*
Leah Sherman, *Associate Professor of Fine Arts.*
Yves J. Gaucher, *Assistant Professor of Fine Arts.*
Stanley E. Horner, *Assistant Professor of Fine Arts.*
Judith Kelly, *Assistant Professor of Fine Arts.*
Roy K. Kiyooka, *Assistant Professor of Fine Arts.*
F. John Miller, *Assistant Professor of Fine Arts.*
H. Leslie Smith, *Assistant Professor of Fine Arts.*
John I. Smith, *Assistant Professor of Fine Arts.*
Norma Springford, *Assistant Professor of Fine Arts.*
Kenneth Adams, *Lecturer in Fine Arts.*
Lucien Coté, *Lecturer in Fine Arts and Theatre Manager.*
Christopher Gabriel-Lacki, *Lecturer in Fine Arts.*
Carol M. Zemel, *Lecturer in Fine Arts.*
Orson Wheeler, *Special Lecturer in Fine Arts.*

### ART

**631 - Art 211. Painting and Drawing**

Prerequisite: Art 231 previously or concurrently. A basic course in drawing and painting investigating the language of picture making. (Full course.)

**631 - Art 221. Introduction to Sculpture Media**

Prerequisite: Art 211 previously or concurrently. An introductory course to sculpture exploring a variety of media, techniques and approaches. (Full course.)

**631 - Art 231. Basic Principles of Art**

An introductory course in art, combining lectures and discussion with studio work. The course is concerned with principles basic to the visual arts and the emphasis is placed upon the recurring problems of art throughout history. Studio work leads towards an understanding and use of art as a visual language. No training or background in art is required. The course is planned to provide an opportunity for the general student as well as art majors to engage in creative activity and expression. (Full course.)

**631 - Art 232. Introduction to Architecture and Sculpture**

To enable the student to understand and appreciate great works in architecture and sculpture, and to develop a discriminative understanding of three-dimensional form in design and in his architectural environment, the main types, styles, and techniques of these arts are explained and illustrated. To understand their significance, the student is encouraged to become familiar with great examples of these arts through pictorial reproductions, slides, models, museum visits, and field trips. (Full course.)



**631 - Art 240. Key Monuments in Art History**

A study of selected works which represent outstanding and significant achievements in the visual arts. This course will provide an introduction to the history of art, and a desirable foundation for students wishing to pursue more specialized studies in this field. (Full course.)

**631 - Art 242. The History of Renaissance Art**

A survey of painting, sculpture and architecture in Italy and Northern Europe during the fifteenth and sixteenth centuries. (Full course.)

**631 - Art 243. History of Modern Art**

Beginning with the rise of Impressionism, this course will examine the main movements and developments in western art during the late nineteenth and twentieth centuries. (Full course.)

**631 - Art 248. The History of Interior Design**

A survey of the history of interior design in western civilization, outlining briefly how particular styles developed out of the social customs, mores, and general spirit of the times. Special emphasis will be laid on the Renaissance, XVIIIth century, and contemporary styles. (Half course.)

**631 - Art 249. Canadian Sculpture and Architecture**

A study of the more important developments of Canadian architecture and sculpture from indigenous forms to contemporary work. (Half course.)

**631 - Art 251. Art For Classroom Use**

A practical and theoretical course of particular interest to teachers. The philosophy of art education, the potentialities of materials and techniques are considered in relation to actual classroom situations. Students are introduced to various creative art media, including painting, collage, construction, printing, and modelling, and are encouraged to see their possibilities for children of different ages. The importance and nature of art in child development is stressed with the aid of films, slides, and selected readings. (Full course.)

**631 - Art 281. Introduction to Graphics Media**

Prerequisite: Art 211 previously or concurrently. An introduction to the graphic media; etching, lithography, woodcut, etc. Elements of the print-making process in theory and practice. The history of the graphic arts and their relationships with other art forms. (Full course.)

**631 - Art 410. Advanced Drawing**

Prerequisite: Art 211 previously or concurrently. An advanced drawing course in which various media, and forms of expression will be explored. Lectures and studio periods. (Full course.)

**631 - Art 411. Advanced Painting**

Prerequisite: Art 211. An advanced treatment of the various media, pictorial composition, and drawing and painting from life. The study and interpretation of various approaches to art, both figurative and non-figurative, helps the student through exploration to discover a personal means of expression. (Full course.)

### 631 - Art 412. Painting and Drawing (Special Study)

Prerequisite: Art 411. A course in which the student chooses and develops his own projects. (Full course.)

### 631 - Art 421. Advanced Sculpture

Prerequisite: Art 221. An advanced course in sculpture with the emphasis placed on personal exploration of media and sculpture problems. (Full course.)

### 631 - Art 422. Sculpture (Special Study)

Prerequisite: Art 421 previously or concurrently. A course in which the student chooses and develops his own projects. Exhibition is required at the end of the course. (Full course.)

### 631 - Art 431. Seminar in the Analysis of Great Works of Art

Prerequisite: Art 231. An advanced course in art principles. Through the formal analysis of selected masterpieces of painting and sculpture the student is led to a fuller comprehension of the nature of formal order in the arts. (Full course.)

### 631 - Art 441. The History of Medieval Art

Prerequisite: Art 240. This course will survey the growth of European art from early Christian times through the fourteenth century. (Full course.)

### 631 - Art 443. History of Baroque and Rococo Art

Prerequisite: Art 240. Commencing with Mannerism, this course will continue on to investigate the major personalties and achievements in Dutch, Flemish, English, French, Italian and Spanish art in the seventeenth and eighteenth centuries. (Full course.)

### 631 - Art 444. History of Canadian and American Art

Prerequisite: Art 240. This course will consider the growth and compare developments in American and Canadian art from earliest colonial times to the present day. (Full course.)

NOTE:—Students who have credit for Fine Arts 244 may not take this course for credit.

### 631 - Art 450. Art in Education

Prerequisites: Art 211, 231. A course for art majors interested in the teaching of art. The student's studio experience is used as a basis for developing a personal philosophy of art education. Studio experiences are combined with readings in the history, philosophy and psychology of art education. Discussions and lectures are included and students are required to observe actual teaching situations. (Full course.)

### 631 - Art 451. Seminar in Art Education

Prerequisites: Art 231, 251. Problems in art, art education, and the creative processes are dealt with on the basis of the individual experience in art and teaching. (Full course.)

### 631 - Art 461. Introduction to Aesthetics

This course provides an introduction to the philosophy and psychology of aesthetics. Topics will include the nature of beauty and art, aesthetic experience, symbolific thinking and expression, art as symbolific activity, art as communication, and the principles of formal organization underlying all the arts: music, poetry, drama, sculpture, and painting. (Full course.)



### 631 - Art 481. Advanced Graphics

Prerequisite: Art 281. An advanced study of various graphic media. The student will investigate and experiment with various approaches, both traditional and contemporary in order to discover a personal means of expression. Lectures and studio periods. (Full course.)

### 631 - Art 482. Graphics (Special Study)

Prerequisites: Art 410; 481 previously or concurrently. A course in which the student will choose and develop his own project. Stress will be placed on creative imagination and experimental work. Lectures and studio periods. (Full course.)

### 631 - Art 490. Advanced Design

Prerequisite: Art 231. A theoretical and practical study of the principles of two and three dimensional design. Special emphasis is given to the study of colour and configuration in various media, as vehicles of visual communication. Lectures, discussions, studio, field trips are related to various areas of design. (Full course.)

NOTE:—Students who have credit for Fine Arts 413 may not take this course for credit.

### 631 - Art 491. Drawing for Communications Media

Prerequisites: Art 211, 410. A theoretical and practical course in drawing as a means of visual communication. Drawing is considered in a broad sense as a direct and immediate form demanding many approaches, diverse media, and compositional means. Historical and contemporary works are studied, and then related to fashion, magazine and other forms of mass media illustration. (Full course.)

### 631 - Art 492. Seminar in the History and Philosophy of Design

Prerequisite: Art 490 previously or concurrently. A seminar to integrate student's studio experience and research as related to the various attitudes, theories, principles, intentions, and functions of the designer in society. Lectures and studio periods. (Full course.)

### 631 - Art 493. Special Studies in Design

Prerequiste: Art 490. An investigation of a special design project in conjunction with field research. Lectures, discussions and studio work. Each student will be required to exhibit his work. (Full course.)

### 631 - Art 494. Graphic Design

Prerequisite: Art 490. A theoretical and practical course in which the principles of design are developed from studio experiences relative to the contemporary graphic image and its historical evolution. Typography, lettering, media, reproduction processes, photography, layout, imagery, symbolism, etc. are considered as expressive means of visual communication. Lectures and studio periods. (Full course.)

## CINEMA

### 632 - Cinema 257. History of the Film

A study of the history of the film from its beginnings to the present. The forms, functions, aesthetics and technology of the film will be dealt with through the examination of individual works. (Full course.)

NOTE:—Students who have credit for Fine Arts 257 may not take this course for credit.

### 632 - Cinema 258. Film Aesthetics

A study of the aesthetics of the film. Symbolism, realism, expressionism, abstraction and other forms of film art will be studied in relation to the great schools and theoreticians in the field. (Full course.)

## DRAMA

### 633 - Drama 212. Stage Design

Prerequisite: Art 231. An introductory course in the design of stage scenery and costume. (Half course.)

NOTE:—Students who have credit for Fine Arts 212 may not take this course for credit.

### 633 - Drama 247. The History of the Theatre

Study of the development of theatrical production and the drama brings before the student the whole shifting scene of manners and customs, ideals and moral standards of the ages. This course traces the development of the theatre from the time of the Greek choric dance to the modern talking-picture and legitimate stage, showing at each step how the culture of that age has been condensed and reflected in the vital and permanent art form of the theatre. (Full course.)

NOTE:—Students who have credit for Fine Arts 247 may not take this course for credit.

### 633 - Drama 252. The Art of Play Production (Introductory)

A study of the fundamental theories of the aesthetics of the theatre and their relationship to the arts contributing to production. Students will participate in a practical programme of productions which will entail work in acting, staging, voice production, pantomime, make-up, lighting, and scenic design. Lectures and practice. (Full course.)

NOTE:—Students who have credit for Fine Arts 252 may not take this course for credit.

### 633 - Drama 455. The Art of Play Production (Intermediate)

Prerequisite: Art 252. A further study of the theories of the aesthetics of the theatre and their relationship to the arts contributing to production. Students will participate in a practical programme of productions which will entail work in acting, staging, voice production, pantomine, make-up, lighting, and scenic design. Lectures and practice. (Full course.)

### 633 - Drama 456. The Art of Play Production (Advanced)

Prerequisite: Art 455. A study of the advanced theories of the aesthetics of the theatre and their relationship to the arts contributing to production. Students will participate in a practical programme of productions which will entail work in acting, staging, voice production, pantomine, make-up, lighting, and scenic design. Lectures and practice. (Full course.)



## MUSIC

### 634 - Music 233. The Understanding and Appreciation of Music

To enable the student to understand and appreciate the great music of the world, and to develop taste and discrimination in music without the necessity of learning to play an instrument. The work of the course consists to a great extent in the actual hearing and analysis of the various types of music and composers, and in musically illustrated lectures and discussion. (Half course.)

NOTE:—Students who have credit for Fine Arts 234 or 233 may not take this course for credit.

### 634 - Music 234. Musical Theory and Form

A more advanced course for the non-performer, affording a more detailed study of musical form, harmony and rhythm, melody, with some consideration of the elementary aesthetics of music. Students with little or no listening experience should take Music 233 previously. (Full course.)

NOTE:—Music 233 and Music 234 may not be taken together.
Students who have credit for Fine Arts 234 may not take this course for credit.

### 634 - Music 245. The History of Music

A study of the development of music in relation to cultural history from antiquity to the present day, stressing the early formative period up to the peak of polyphonic writing. Topics for discussion will include: Greek, Chinese, and Hebrew music; sacred and secular monody; polyphony; Ars Antiqua; Ars Nova; Netherlands Schools; motet and madrigal; the "classical" outlook; the "romantic" outlook; impressionism; neoclassicism; atonalism; jazz and its influence. The course will be illustrated by recordings. No special background of musical training is required (Full course.)

NOTE:—Students who have credit for Fine Arts 245 may not take this course for credit.

### 634 - Music 246. Beethoven

Prerequisite: Art 234 or equivalent. A study of the life and works of Ludwig von Beethoven. Beethoven's compositions as a whole will be surveyed: detailed studies such as the stylic changes as illustrated in the quartets, advances in formal design, the problem of emotional content, and several other specific topics related to individual compositions will be discussed in full. This course will be illustrated with copious musical examples. (Half course.)

NOTE:—Students who have credit for Fine Arts 246 may not take this course for credit.

## FRENCH

James H. Whitelaw, *Professor of Modern Languages, and Chairman of the Department of French.*

Michel Euvrard, *Associate Professor of French.*
Léandre Bergeron, *Assistant Professor of French.*
Albert Jordan, *Assistant Professor of French.*
Serge Losique, *Assistant Professor of French.*
Pierre Parc, *Assistant Professor of French.*
Gilbert C. Taggart, *Assistant Professor of French.*
Mair E. Verthuy, *Sessional Lecturer in French.*

Since university-level credit cannot be given for French conversation only, all language courses contain a varying quantity of written work, grammatical study and civilization material, as well as oral work.

### 603 - French 201. Beginners' French

This course is designed for students who lack any previous training in French or who otherwise fail to meet the requirements for admission to French 211. Intensive class instruction and laboratory drill should permit the student to master the basic structures of French in both their written and oral aspects. Satisfactory progress in this course will admit students to French 211. Lectures and laboratory. (Full course.)

NOTE:—Students who have received credit toward their admission for high school French may not take this course for credit.

Students whose first language is French, or whose schooling has been conducted in French, will not be admitted to this course.

Any student who is not sure of his standing must consult the chairman of the department prior to registration.

### 603 - French 211. Introduction to College French

Prerequisite: French 201 or four years of high school French or equivalent. A practical review of structures designed to develop fluency in French by means of intensive oral and written practice. Readings in French-Canadian culture. Lectures and laboratory. (Full course.)

NOTE:—Students whose first language is French, or whose schooling has been conducted in French, will not be admitted to this course.

Students who have credit for French 212 may not take this course for credit.

### 603 - French 214. Intermediate College French

Prerequisite: French 211 or 212, or equivalent. Oral fluency will be promoted through class discussion and exposés based on current and literary topics. Attention will also be paid to accurate and idiomatic written expression. This course is intended to give suitable command of the language for students intending to study French literature, and for those contemplating or engaged in teaching the language. Enrollment is restricted to twenty students. This course is conducted in French. (Full course.)

NOTE:—Students whose schooling has been conducted in French will not be admitted to this course.

Students who have credit for French 213 may not take this course for credit.

### 603 - French 221. Introduction to French Literature

Prerequisite: French 211 or 212, or equivalent. No prerequisite for students whose first language is French. This course, designed to act as a preparation for all courses in French literature, covers the principal literary trends from the Middle Ages to the present day. Students who have taken this course will then be able to relate subsequent and more detailed courses to the general framework of French literature and society, and will have acquired a working knowledge of such essentials as versification and other literary forms, as well as a familiarity with the "explication de texte". This course is conducted in French. (Full course.)

### 603 - French 222. Modern French Literature

Prerequisite: French 211 or 212, or equivalent. No prerequisite for students whose first language is French. This course is intended mainly for students in Science and Commerce, in particular those wishing to take their literature requirement in French. Through study of a limited number of novels, plays and poems of recent years, both French and French-Canadian, the student will have an opportunity to appreciate the characteristics of the different genres. (Full course.)

NOTE:—This course is not an acceptable prerequisite for any other French course.



### 603 - French 231. French Canadian Literature and Culture

Prerequisite: French 211 or 212; no prerequisite for students whose first language is French. An outline of the development of French-Canadian culture from the earliest times to the present day, with particular emphasis on recent developments. This course is conducted in French. (Full course.)

### 603 - French 411. Advanced Composition and Stylistics

Prerequisite: French 214. An advanced language course, designed to give the student practice in the finer points of the structure of the French language, together with an insight into its stylistic resources. Enrollment is restricted to twenty students. This course is conducted in French. (Full course.)

### 603 - French 412. History of the French Language

Prerequisites: French 211 or 212, 214, 221. This course traces the evolution of the language from the Vulgar Latin period to the present day. The successive stages of this evolution will be illustrated by the study of appropriate texts, especially those of the Old French period. This course is conducted in French. (Full course.)

### 603 - French 413. French Phonetics

Prerequisites: French 211 or 212, 214; alternative prerequisite for students whose first language is French: one credit in French language or literature; this course is open only to students in third or fourth year. A descriptive course in French phonetics, including a study of the physiological formation of sounds and their acoustic aspects. Phonetic transcriptions. Teachers of French will find this course particularly useful, as will students planning to do graduate work in French. This course is conducted in French. (Half course.)

### 603 - French 414. Comparative Stylistics and Translation

Prerequisite: French 214: alternative prerequisite for students whose first language is French, one credit in French language or literature. The aim of the course is to investigate the stylistic resources of both French and English and to study comparatively the means available for the expression of the same concept. The course will permit the student to further his knowledge of the different levels of expression in each language, taking into account both syntax and vocabulary. This is *not* a course in commercial translation. (Full course.)

### 603 - French 421. French Literature of the 16th Century

Prerequisite: French 221. Italian influence; Marot; Rabelais, Ronsard and la Pléïade; Montaigne. (Half course.)

### 603 - French 422. French Literature of the 17th Century

Prerequisite: French 221. This course covers the great classical period of French literature: the reform of the language, and the formation of the Classical doctrine; the tragic drama of Corneille and Racine; the comedy of Molière; the philosophy of Descartes and Pascal; the moral satire of La Fontaine and La Bruyère; the beginnings of the Novel. (Full course.)

### 603 - French 423. French Literature of the 18th Century

Prerequisite: French 221. The "century of the philosophers" — The great interest in scientific knowledge, leading to the composition of the Encylopédie; Montesquieu, Voltaire, Rousseau; the comedy of Marivaux and Beaumarchais; the poetry of Chenier; the beginnings of the Romantic movement; the literature of the Revolution. (Full course.)

### 603 - French 425. French Literature of the 20th Century

Prerequisite: French 221. A study of the work of major French writers from the beginning of the twentieth century to the present day. (Full course.)

### 603 - French 426. Literature of the Romantic and Realist Periods

Prerequisite: French 221. The fore-runners of Romanticism — Chateaubriand and Madame de Staël. Romanticism — Lamartine, Vigny, Hugo, Musset. The novel — Stendhal, Balzac, Flaubert, Zola. (Full course.)

NOTE:—Students who have credit for French 424 may not take this course for credit.

### 603 - French 427. Nineteenth Century Poetry from Baudelaire to Mallarmé

Prerequisites: French 221; 426 previously or concurrently. The beginnings of modern French poetry — Nerval and Baudelaire. The Parnassiens — Gautier, Leconte de Lisle, Hérédia. The Symbolists — Rimbaud, Verlaine, Mallarmé. (Half course.)

NOTE:—Students who have credit for French 424 may not take this course for credit.

### 603 - French 431. The Contemporary French-Canadian Novel

Prerequisite: French 231. A study of a selection of important recent French-Canadian novels. (Half course.)

### 603 - French 432. Contemporary French-Canadian Poetry

Prerequisite: French 231. A study of the works of important recent French-Canadian poets. (Half course.)

### 603 - French 451. Advanced Study of a Special Subject

Prerequisites: French 221; two additional credits in French Literature. This course, open only to fourth-year students majoring or honouring in French, provides the opportunity of studying a subject in depth. Students work individually under supervisor. (Full course.)

Subject for 1967-68: Montesquieu.

### 603 - French 461. The French Cinema

Prerequisites: French 211, 214, 221. The aim of this course is to study the French cinema in its vital relationship with contemporary French civilization. Beginning at the close of the last century, the course will be divided into two-week periods, each of which will study a particular step in the evolution of the French film, and will be illustrated by examples. (Full course.)

NOTE:—This course will be offered in 1968-69.

### Cognate Course

See also **Linguistics 211. Introduction to Linguistics.**

## MATHEMATICS

See Faculty of Science for course descriptions.



## MODERN LANGUAGES

James Henry Whitelaw, *Coordinator.*

## GERMAN

Annamaria Ketter, *Assistant Professor of German.*

### 604 - German 211. Introductory Course in German

A beginner's course in the German language which is designed, in one year, to make the student conversant with the grammar, pronunciation and ordinary vocabulary of the language. Emphasis is placed upon learning to speak the language, as well as to read and write it. Lectures and laboratory. (Full course.)

NOTE:—Students whose first language is German, or whose schooling has been conducted in German, will not be admitted to this course.

Students who have credit for German 215 may not take this course for credit.

### 604 - German 212. German Language - Intermediate

Prerequisite: German 211 or equivalent. Advanced instruction in the language. Emphasis upon idiom and usage in conversation and composition. Representative readings from the works of German writers. (Full course.)

NOTE:—Students whose first language is German, or whose schooling has been conducted in German, will not be admitted to this course.

### 604 - German 215. German for Reading Knowledge

This course will give the student sufficient background in the structure of the language to be able to read German with reasonable competence. Practice material will be both technical and non-technical. No previous knowledge of the language is required. (Full course.)

NOTE:—Students whose first language is German, or whose schooling has been conducted in German, will not be admitted to this course.

Students who have credit for German 211 may not take this course for credit. This is a terminal course, and may not be used as a prerequisite for advanced courses in German.

### 604 - German 421. Advanced German Language and Study of the Deutsche Novelle

Prerequisite: German 212 or equivalent. Advanced composition and oral work. A study of the Deutsche Novelle from Goethe to Kafke. This course is conducted entirely in German. (Full course.)

### 604 - German 422. Advanced German Language and Study of Literature from 1750 to 1830

Prerequisite: German 212 or equivalent. Advanced composition and oral work. Study of the work of Goethe, Schiller, Schlegel, Brentano and others. This course is conducted entirely in German. (Full course.)

### 604 - German 451. Reading Course in the Modern German Novel

Prerequisite: German 421 or 422. A study of the German novel since 1900. There will be no class periods, and students will work under the direct supervision of the instructor. Regular assignments will be given, and written and oral examinations will be given at the end of the course. (Full course.)

## *HEBREW*

The University reserves the right to place any student in the course for which he is best suited.

### 606 - Hebrew 211. Introductory Course in Hebrew

A beginners' course in Hebrew, spoken and written, with reading of classical and modern texts. Lectures and laboratory. (Full course.)

### 606 - Hebrew 212. Intermediate Course in Hebrew

Prerequisite: Hebrew 211 or equivalent. Readings in the Bible and an introduction to modern Hebrew literature. This course will also complete the study of Hebrew grammar and syntax begun in Hebrew 211, with special emphasis on modern Hebrew usage. (Full course.)

### 606 - Hebrew 421. Hebrew Literature

Prerequisite: Hebrew 212 or equivalent. A study of classical and modern works of Hebrew literature, together with advanced work in the language. (Full course.)

## *RUSSIAN*

Angelika-Tatiana Sidorow, *Assistant Professor of Russian.*

### 611 - Russian 211. Introductory Course in Russian

A beginner's course in the Russian language which is designed in one year to acquaint the student with pronunciation, the main grammatical aspects and a basic vocabulary. Emphasis is placed on speaking, reading and writing Russian. Lectures and laboratory. (Full course.)

NOTE:—Students whose first language is Russian, or whose schooling has been conducted in Russian, will not be admitted to this course. Students who have credit for Russian 215 may not take this course for credit.

### 611 - Russian 212. Intermediate Russian

Prerequisite: Russian 211 or equivalent. This course consists of a complete review of Russian grammar, composition, reading and conversation. Through reading of short stories and additional material, the student is given the opportunity of acquainting himself with Russian culture and literature. (Full course.)

NOTE:—Students whose first language is Russian, or whose schooling has been conducted in Russian, will not be admitted to this course.

### 611 - Russian 215. Reading Course in Russian

This course will give the student sufficient grasp of the structure of the language and sufficient basic vocabulary to be able to read Russian with the aid of a dictionary. Both technical and non-technical material will be used. (Full course.)

NOTE:—Students whose first language is Russian, or whose schooling has been conducted in Russian, will not be admitted to this course.

Students who have credit for Russian 211 may not take this course for credit. This is a terminal course, and may not be used as a prerequisite for advanced courses in Russian.

### 610 - Russian 421. Introduction to 19th Century Russian Literature Through the Short Story

Prerequisite: Russian 212 or equivalent. The short story will be used both as a subject for literary study and as a reflection of the history and social preoccupations of the period. Opportunity will be provided for discussion and some attention will be paid to composition. This course is conducted in Russian. (Full course.)



## *SPANISH*

John D. Grayson, *Assistant Professor of Spanish*
Joseph A. Macaluso, *Assistant Professor of Spanish.*

### 612 - Spanish 211. Introductory Course in Spanish

A beginner's course in the Spanish language, which is designed in one year to acquaint the student with the main grammatical principles and basic vocabulary. Practice is given in reading, writing and conversation, particular emphasis being placed on oral work. In the second term, classes are conducted as far as is possible in Spanish. Lectures and laboratory. (Full course.)

NOTE:—Students whose first language is Spanish, or whose schooling has been conducted in Spanish, will not be admitted to this course.

### 612 - Spanish 212. Intermediate Spanish

Prerequisite: Spanish 211, or two or three years of high-school Spanish, or equivalent. Included in this course are a complete review of Spanish grammar and a study of some of the more advanced aspects of usage. Through the reading of short stories and novels, the student is given the opportunity to acquaint himself with Spanish and Spanish-American letters and civilization. Classes will be conducted in Spanish. (Full course.)

NOTE:—Students whose first language is Spanish, or whose schooling has been conducted in Spanish, will not be admitted to this course.

### 612 - Spanish 421. Introduction to the Literature of Spanish America

Prerequisite: Spanish 212 or equivalent. The aim of this course is to familiarize the student with the history, political thought and civilization of Spanish America as expressed through her literature. Ample practice is given in oral expression and advanced composition. Classes will be conducted in Spanish. (Full course.)

### 612 - Spanish 422. Introduction to the Literature of Spain

Prerequisite: Spanish 212 or equivalent. A survey of Spanish literature from the beginning of the Middle Ages to the end of the nineteenth century. Ample practice is given in oral expression and advanced composition. Classes will be conducted in Spanish. (Full course.)

### 612 - Spanish 423. Twentieth Century Spanish Literature

Prerequisite: Spanish 212. A study of the literature of Spain, starting with the Generation of '98 and going up to the present day. Ample practice is given in oral expression and advanced composition. Classes will be conducted in Spanish. (Full course.)

### Cognate Course

See also **Linguistics 211. Introduction to Linguistics.**

## PHILOSOPHY

William Ross Fraser, *Professor of Philosophy, and Chairman of the Department.*
Roger B. Angel, *Associate Professor of Philosophy.*
Owen Dukelow, *Associate Professor of Philosophy.*
M. Mobin Ahmad, *Assistant Professor of Philosophy.*

### 609 - Philosophy 211. A General Study of Philosophical Problems

The purpose of this course is to distinguish philosophy from art, science, and religion; to study the critical work of philosophy with regard to some basic concepts and methods relevant to such fields; and to consider the constructive work of philosophy as shown in the development of major world-views. (Full course.)

### 609 - Philosophy 221. Great Philosophers, Ancient, Medieval, and Modern

This course aims to make the student conscious of his own intellectual heritage by means of a first-hand acquaintance with the thoughts of those philosophers, from Plato to the present day, who have been most influential in the moulding of the Western mind. It will also illuminate the character of philosophic problems by showing how they persist through a variety of forms, and are restated from age to age. Readings, lectures and discussions. (Full course.)

### 609 - Philosophy 231. Philosophy of Religion

This course considers the nature, method, and value of religion; the relation between religion and science, and between religion and philosophy; the concepts of God, prayer, evil, freedom, and immortality, and outstanding types of religious philosophy. (Half course.)

### 609 - Philosophy 241. Ethics

An introduction to theoretical and applied ethics. In this course attention will be given to the history of ethical thought, present philosophic discussion of ethics, and the application of ethics on the personal and social level. (Full course.)

### 609 - Philosophy 251. Logic

Beginning with stress on different functions of language and on errors in symbolism, this course considers the problem of definition, mediate and immediate inferences, fallacies in deduction, and extension of traditional logic. (Half course.)

NOTE:—Only one-half credit will be given from among Philosophy 251, 451, and 454.

### 609 - Philosophy 261. Philosophic Ideas in Literature

This course is a critical survey of concepts that have been widely influential through poetry and prose. Theories of beauty, of knowledge, of human conduct and religion, and of cultural change receive special attention. Class discussion on masterpieces in world literature is particularly encouraged. (Full course.)

### 609 - Philosophy 281. Scholastic Philosophy

The Aristotelian metaphysics. The Thomistic adaption of Aristotle, and its solution of the problems of change, intellection and being. Ethics. Contemporary significance of the traditional philosophy. Modern psychology, physical science and art in the context of this traditional philosophy. (Full course.)

### 609 - Philosophy 411. Contemporary Philosophy

Prerequisite: Philosophy 211 or 221. A critical study of contemporary tendencies in Logic, Epistemology, Theory of Value, and Metaphysics. There will be readings and class discussions in respect of such philosophers as Santayana, Russell, Whitehead, and Dewey with special reference to their outlook on scientific methodology, education, ethical and aesthetic values, political and economic problems, and the philosophy of religion. (Full course.)

### 609 - Philosophy 412. Systems of Philosophy

Prerequisites: two credits in Philosophy. This course seeks finer appreciation of attempts to consider man and nature from a persisting point of view. Among the systems of philosophy considered are supernaturalism (including Scholasticism), naturalism (including dialectical materialism), idealism, realism, and pragmatism. Special attention is given to students desiring discussion on implications of various world-views. (Full course.)



### 609 - Philosophy 413. Contemporary Epistemology

Prerequisite: Philosophy 211. A study of the major issues in contemporary theory of knowledge as they have evolved from the turn of the century to the present day. Special emphasis will be given to such topics as the theory of perception, knowledge of the past, knowledge of other minds, the analytic-synthetic dichotomy and the nature of truth. These matters will be presented through an intensive reading of selected British and American epistemologists. (Full course.)

### 609 - Philosophy 421. British Empiricism

Prerequisite: Philosophy 211 or 221. This course studies intensively the works of Locke, Berkeley, and Hume. (Full course.)

### 609 - Philosophy 452. Scientific Methods

In this course, after study of the nature of a scientific system, and of inductive reasoning, there follows an analysis of the principles of causal determination. The next stage deals with the formal requirements of a scientific hypothesis and of hypothetical methods. The logic of the various experimental methods used in testing hypotheses is then carefully examined. After a brief survey of statistical methods, the course ends with a comparison between the experimental and the historical sciences. (Half course.)

### 609 - Philosophy 453. Philosophy of Science

Prerequisites: Philosophy 452, and 251 or 454, or prior permission of the instructor. This study deals with the analysis of major concepts and pre-suppositions of the sciences and with attempts to formulate a philosophy compatible with the broader implications of scientific theories. Among different interpretations of science, are considered the positivistic, the idealistic and the materialistic. In this course lectures are kept at a minimum, and students present papers to be discussed and criticized. (Full course.)

### 609 - Philosophy 454. Introduction to Modern Logic.

Prerequisites: Philosophy 211 or four credits in Mathematics. Designed for the student who is interested in the technical aspects of logic, this course will introduce him to the techniques of symbolic logic with special reference to valid argument forms, definitions, truth-tables and quantification. (Half course.)

NOTE:—Only one-half credit will be given from among Philosophy 251, 451, and 454.

### 609 - Philosophy 461. The Logic and Epistemology of History

Prerequisites: two credits in Philosophy and two credits in History, or permission of the department. A critical examination of the problems of knowledge and the language of the historical sciences. (Full course.)

### 609 - Philosophy 471. The Study of a Given Thinker

Prerequisite: Philosophy 211 or 221. Each year this course concerns one philosopher (ancient, medieval, or modern) of outstanding importance. Special attention is given to the cultural background, the personal development, and the leading theories of the thinker, as well as to critical evaluations of his work. (Full course.)

NOTE:—With the permission of the department, a student may take this course twice for credit, provided that a different philosopher is dealt with the second time. He will register the second time under Philosophy 472.

### 609 - Philosophy 472. The Study of a Given Thinker

Prerequisites: Philosophy 471 and permission of the department. A student repeating Philosophy 471 a second time for credit registers under Philosophy 472. (Full course.)

## RELIGION

Boyd G. Sinyard, *Associate Professor of Religion, and Chairman of the Department.*
Michel Despland, *Assistant Professor of Religion.*
Sheila McDonough, *Assistant Professor of Religion.*
G. Albert B. Moore, *Assistant Professor of Religion.*
John L. Rossner, *Assistant Professor of Religion.*

### 610 - Religion 213. The Religions of the World

Historical and critical introduction to the study of religion; the religions of the ancient Near East; Greek and Roman religion; Judaism, Zoroastrianism, Manichaeism, Mithraism and Islam; the religions of India, China and Japan. Consideration is given to the philosophical, theological, ethical and cultural implications. (Full course.)

NOTE:—Only one full credit will be given from among Religion 211, 212, and 213.

### 610 - Religion 221. Religion, Science and Philosophy

The place of religion in human culture and its relation to other modes of interpreting human existence, particularly science and philosophy. The methodology of the study of religion; the specific content of the religious affirmations of the Judaco-Christian tradition; their modes of historical development and symbolic expression. Considerable attention is given to current religious thought. (Full course.)

### 610 - Religion 231. Religion, Ethics and Society

The course attempts to identify ethical issues facing individuals and societies today (e.g. economic inequality, race relations, nationalism, violence and war, sex and personal identity, affluence and anonimity, etc.). The resources of the Judaco-Christian understanding of man will be considered and their role in the interpretation and resolution of these ethical dilemmas evaluated. (Full course.)

### 610 - Religion 243. The Religious History of Western Man

A study of the development of the religious perspectives of Western man which is concerned with the origin of such perspectives and the mode of their development within the general history of Western European culture. Attention will focus on Graeco-Roman period, the Middle Ages and the Early Modern Period. (Full course.)

NOTE:—Only one full credit will be given from among Religion 241, 242, and 243.

### 610 - Religion 251. Old Testament Studies

An introduction to the methods and results of contemporary Old Testament scholarship; the history, culture and religion of ancient Israel; critical survey of Old Testament literature. Particular attention is given to the major religious affirmations and theological concepts in this literature which have become central n the subsequent development of the Western religious tradition. (Half course.)

### 610 - Religion 252. New Testament Studies

An introduction to the methods and results of contemporary New Testament scholarship; a critical survey of New Testament literature considering historical setting, history of text, religious and cultural significance. Attention is given to the central issues and concepts portrayed in the Synoptic, Johannine and Pauline writings and their importance in the subsequent development in the Western religious tradition. (Half course.)



### 610 - Religion 261. Religion in Canada

The historical development of the major religious traditions in Canada, their influence on the social, political and cultural areas of Canadian life, and their contemporary significance. Attention will also focus on the interaction of Catholic, Protestant, Jewish, Indian and Eskimo groups. (Full course.)

### 610 - Religion 263. Byzantine and Russian Christianity

The historical, cultural and philosophical significance of Eastern Christianity with particular attention given the Byzantine civilization and the history of Russia. (Full course.)

### 610 - Religion 411. Hinduism

Prerequisite: third-year standing. A comprehensive study of the religion, philosophy, ethics, history and culture of Hinduism. (Half course.)

### 610 - Religion 412. Buddhism

Prerequisite: third-year standing. A comprehensive study of the philosophy, ethics and religion of Buddhism, including Zen Buddhism. (Half course.)

### 610 - Religion 413. Islam

Prerequisite: third-year standing. Pre-Islamic Arabia; the Prophet; the QUR'AN. The period of the four Caliphs and Ummayad period. The Abbasids; Mongols and the Fatimid caliphate. The philosophy of Ibn Rushd, Ibn Sina and Ghazzali. Medieval Islam; the impact of the West; Islamic modernism. The social, political and ethical problems of present-day Islam. (Full course.)

### 610 - Religion 414. Judaism

Prerequisite: third-year standing. A comprehensive study of the history, law, ethics, religion, philosophy and culture of the Jewish people. (Full course.)

### 610 - Religion 443. Contemporary Philosophy of Religion

Prerequisites: two full courses in Religion and/or Philosophy or approval of the instructor. An historical study of the major themes of philosophy of religion in the nineteenth and twentieth centuries: the Enlightenment and the Romantic reaction; Schleiermacher and Hegel; the left-wing Hegelians; liberalism, and the neo-orthodox reaction; idealism, naturalism and the religious perspective; positivism, neo-Thomism and contemporary problems. (Full course.)

### 610 - Religion 444. Existentialism, Phenomenology and Religion

Prerequisites: two full courses in Philosophy and/or Religion. A study of selected works of authors usually associated with this trend in modern philosophy. (Kierkegaard, Nietzsche, Sartre, Jaspers, Camus, Kafka, Buber, Marcel, Tillich, Heidegger, et. al.) Attention is given to existential analysis, philosophical anthropology and phenomenology as these relate to philosophy of religion. (Full course.)

### 610 - Religion 462. From Renaissance Humanism to Puritanism

Prerequisite: third-year standing. Religious and intellectual movements in the sixteenth century, including Renaissance Platonism, the Protestant, the Radical and the Catholic Reformations. Attention will focus on the relationship between religious and cultural changes. A study will be made of selected works of the following authors: Petrarch, Ficino, Pico, Bruno, Valla, Colet, More, Cranmer, Erasmus, Luther, Munzer, Calvin, Ignatius and Milton. (Full course.)

## CANADIAN STUDIES

### 613 - Canadian Studies 411. Seminar in Canadian Studies

Prerequisite: registration in fourth year of the major in Canadian Studies. This is a seminar course in Canadian Studies which involves participation by interested members of the staff as well as by students in the fourth year of the major in Canadian Studies. (Full course.)

# SOCIAL SCIENCES DIVISION

Herbert Quinn, *Senior Professor*

## SOCIAL SCIENCE

Jack Goldner, *Assistant Professor of Social Science.*

### 700 - Social Science 210. General Course in the Social Sciences

This pandemic course has the same point of view and objectives with regard to the social sciences as Natural Science 210 has regarding the natural sciences. It has a twofold purpose; first, to introduce the student to some of the basic concepts and subject matter of the various social sciences; second, to provide him with some knowledge of contemporary society and the problems which confront it. The social sciences surveyed are Anthropology, Psychology, Sociology, Human Geography, History, Economics, and Political Science. (Full course.)

## APPLIED SOCIAL SCIENCE

Hedley G. Dimock, *Associate Professor of Applied Social Science, and Chairman of the Department.*

Henry F. Hall, *Professor of Natural Science.*
Robert C. Rae, *Professor of Applied Social Science.*
Richard McDonald, *Associate Professor of Applied Social Science.*
Jack Goldner, *Assistant Professor of Social Science.*
J. Alexander Sproule, *Assistant Professor of Applied Social Science.*
John B. Hopkins, *Lecturer in Applied Social Science.*
John D. Jackson, *Lecturer in Applied Social Science.*

### 708 - Applied Social Science 211. History, Philosophy, and Organization of the Young Men's Christian Association

The origin and development of the YMCA organization on national, international and world-wide scales; institutional patterns and methods of work; the significance of purpose and aims; Christian emphasis in the YMCA. (Half course.)

### 708 - Applied Social Science 221. Administration of Community Serving Agencies

The development of the administrative process and the principles and methods of administration and organization of community agencies. Specific areas of administration analyzed include personnel, financing, maintenance, public relations, personal efficiency and adequate recording processes. (Half course.)

### 708 - Applied Social Science 231. Programme Materials and Methods

(Not offered in 1967-68) For course description, see 1966-67 announcement.



### 708 - Applied Social Science 241. Camp Leadership and Programme Administration

Prerequisite: previous experience on the staff of a summer camp for a minimum of one summer, or permission of the department. An analysis of the use of the camp setting, programme methods and group experiences in achieving educational goals with children and youth. Consideration of the employment, development and morale of camp staff. Discussion of the effects of various practices on the adjustment and growth of campers. (Half course.)

### 708 - Applied Social Science 251. Understanding Group Behaviour

Prerequisite: first-year students may not register for this course. This is a laboratory course which includes participating in a group and analyzing such common group dynamics as leadership, communication, decision making, member roles and sensitivity to others. (Half course.)

### 708 - Applied Social Science 411. Introduction to Social Gerontology

Prerequisite: previous course in Psychology, Sociology, or Social Science 210. A multi-disciplinary orientation to the study of old age with emphasis on the biological, psychological and sociological aspects of aging. A seminar course designed to acquaint students of all ages with the growing volume of research on aging. (Half course.)

### 708 - Applied Social Science 431. Group Development and Supervision

Orientation to systematic group development in community-serving organizations. Development of understanding and skill of group procedures in settings including boards, committees, programme groups, classes, and special interest groups. Each student will study the growth and development of an agency group. Recruitment, selection, in-service training, supervision and evaluation of programme leaders. First year students may not register for this course. (Full course.)

### 708 - Applied Social Science 441. Community Development

Prerequisite: Sociology 211. Orientation to systematic community problem solving dealing with communications, assessment of needs, decision making, and inter-group relations, drawing on the contributions of the social sciences. (Half course.)

### 708 - Applied Social Science 451. Principles and Practices of Guidance

Prerequisite: Psychology 211 or Sociology 211. Principles and methods of counselling and guidance with particular reference to their application in the setting of the community-serving organizations. Organization and administration of a guidance service including measurement and appraisal, techniques of counselling, occupational and educational information, and referral, will be considered. (Half course.)

### 708 - Applied Social Science 452. Introduction to Counselling in Community Service Organizations

Prerequisites: Psychology 211 or Sociology 211; Applied Social Science 451. A survey of typical problems; information, techniques, principles, policies and points of view useful to professional staff in community-serving organizations; focus on educational, vocational and relationship problems, and the use of counselling techniques in staff relations and supervision. (Half course.)

### 708 - Applied Social Science 461. Social Welfare

A general course concerned with social welfare problems in modern society; some analysis of these problems in relation to economic trends and cultural patterns. A description of the public and private agencies that have been established to provide social welfare services to meet the needs that arise in society. Course open to 3rd or 4th year students only or by permission of the department chairman. (Half course.)

### 708 - Applied Social Science 462. The Social Welfare Services

Prerequisite: Applied Social Science 461. A description of the functional settings in which social welfare services are practised. A consideration of the different divisions of social work services, i.e., case work, group work, community organization, administration and research. The use of case materials to illustrate the type of problems dealt with in these divisions. Some consideration of the connective links between social welfare services and religion, law, medicine, nursing, teaching and other callings. Course open to 3rd and 4th year students or by permission of the department chairman. (Half course.)

### 708 - Applied Social Science 471. Projects Seminar

Prerequisite: open to all 4th-year majors in Applied Social Science with permission of the department. A seminar course for field projects, surveys and research studies undertaken by each student. (Full course.)

## ECONOMICS

Arthur Lermer, *Professor of Economics, and Chairman of the Department.*
John Wilfrid O'Brien, *Professor of Economics.*
Muriel Armstrong, *Associate Professor of Economics.*
Shreekant A. Palekar, *Associate Professor of Economics.*
Vivian C. Walsh, *Associate Professor of Economics.*
Voyo Kovalski, *Assistant Professor of Economics.*
George Lermer, *Assistant Professor of Economics.*
Balbir S. Sahni, *Assistant Professor of Economics.*
Abraham Tarasofsky, *Assistant Professor of Economics.*
John P. Barrados, *Lecturer in Economics.*
Barry D. Rosenfeld, *Lecturer in Economics.*
A. G. Frank, *Visiting Professor of Economics.*

Commerce students interested in general courses in Economics should take in addition to Economics 211,—Economics 221, 271, 411, 424, 451 or 461.

### 701 - Economics 211. Introduction to Economics

While this course is an essential introduction for the student who is proceeding to other courses in economics, it is designed to inform every student, whatever his field may be, of some of the basic principles of modern economic theory and their relationships to everyday business. The concept and purpose of national income analysis is explained, and the inter-related problems of consumer spending, saving and investment are discussed with special reference to the banking system, credit policies and the role of government in the business world today. This is co-ordinated with an outline of the theory of the firm and the relation of the individual firm to the whole economy, tracing the process of price-determination through an analysis of the concepts of competition and monopoly. (Full course.)



### 701 - Economics 221. General Economic History

The central theme is the problem of economic growth in the past. Following a brief study of ancient civilizations and the early middle ages, extensive treatment will be given to economic problems of western Europe between the 11th and early 18th centuries. Emphasis will be placed on the industrial revolution and its effects on contemporary patterns of economic and social organization. The course will then proceed to the 19th and early 20th century with particular attention given to the 1914-1932 period. (Full course.)

### 701 - Economics 271. Labor Economics and Labor Relations

Prerequisite: Economics 211. A study of the theoretical and institutional aspects of labor relations. In particular, the course will deal with the principles of wage determination; a study of the relation between wages and employment, wages and prices, labor's share of the national income, the impact of the union on wage determination; the problem of full employment and unemployment; the structure and philosophy of labor organization; the principles and practice of collective bargaining, role of government in labor disputes, wage regulation and social security; labor problems in underdeveloped countries. Special emphasis will be placed on labor problems in Canada. (Full course.)

### 701 - Economics 411. Intermediate Economic Theory

Prerequisite: Economics 211. This course is designed for the student honouring or majoring in economics. It is a basic course in micro-economic theory; market price determination, theory of consumer demand, theory of the firm, and distribution theory. (Full course.)

### 701 - Economics 412. Advanced Economic Theory

Prerequisites: Economics 211, 411 or permission of the department. An extension of Economics 411 with special emphasis on the theory of the firm and the theory of distribution. (Full course.)

### 701 - Economics 421. History of Economic Thought, Ideas, and Theories

Prerequisites: Economics 211, 411. A brief study of the development of economic thought, with special emphasis on the classical and Neo-classical period, as an introduction to modern economic theories. (Full course.)

### 701 - Economics 422. Theories and Determinants of Economic Growth

Prerequisite: Economics 211. A study of the general principles and problems of economic development of countries such as India, Indonesia, the Philippines and Mexico. The empirical analysis will center on problems of capital formation, fiscal policies, population growth, foreign investment, supply of entrepreneurship, and the general institutional framework of these countries. The theoretical analysis will examine critically the content and applicability of the various growth models including the classical, Marxist, Schumpetarian, Harrod-Domar, Rostow models of economic growth and techniques of development planning in terms of investment criteria and priorities. (Full course.)

### 701 - Economics 423. Regional Economics and the Economic Development of Quebec

Prerequisite: Economics 211. Theories of industrial agglomeration, city and metropolitan formation. Economic structure of regions, with emphasis on Quebec's economic development and the regional aspects of its growth problems. Students taking this course may also be interested in Economics 427. (Half course.)

### 701 - Economics 424. Canadian Economic Development

Prerequisite: Economics 211. This course is designed to introduce the student to Canadian economic development from the early period of settlement to the present day. Emphasis will be placed on problems and policies of the Canadian economy. (Full course.)

NOTE:—Students who have credit for Economics 224 may not take this course for credit.

### 701 - Economics 425. Studies in Economic Growth

Prerequisites: Economics 211, 422. A seminar on planning for growth in developed and developing economies with reference to indicative (mixed economies) and collective planning systems. (Half course.)

### 701 - Economics 426. Seminar in Economic History

Prerequisites: Economics 211, 221. An attempt to relate the economic development of major countries in the modern world (in Asia, Europe, and North America), to trace the history of forms of economic organization, institutional development and technology, and to test some basic principles of economic theory by historical evidence. (Half course.)

### 701 - Economics 427. Theory of Industrial Location

Prerequisite: Economics 211. This course deals primarily with the economic determinants of industrial location such as, for example, transportation, labour, motive-power and other basic factors, with particular reference to federal-provincial relations. Students taking this course may also be interested in Economics 423. (Half course.)

### 701 - Economics 429. Latin American and Caribbean Economic Development

Prerequisites: Economics 211, 422. This course deals with the socio-political background of the area since the establishment of independence in the respective nations. While a general approach to the development of the continent as a whole will serve as a point of departure, some sub-areas representing different patterns of development or economic retardation will be treated. Special emphasis will be placed on the role of ideologies, governments in the process of economic growth, the position of entrepreneurship, capital formation, agriculture, interregionalism, and external economic aid. (Full course.)

### 701 - Economics 431. Economic Policy

Prerequisite: Economics 211. A study of government economic policy with emphasis on Canadian policy problems. Topics will include government regulation of business, commercial policy, policies to encourage growth, social security, and, to a very limited extent, monetary and fiscal policy. (Full course.)

### 701 - Economics 444. Marxism and the Communist Economies

Prerequisite: Economics 211. Comparative analysis of communist economic systems, taking two or three representative systems as examples. The social and ideological forces affecting the economic development of selected communist countries. The basic structure of their economies. State planning and administrative procedures. The main emphasis on the effect of planning upon economic growth; the problem of allocation of capital and the priority of growth; economic efficiency versus expediency; alternative means of achieving greater economic growth. (Full course.)



### Economics 445. Contemporary Capitalism and the Welfare State

Prerequisite: Economics 211. The course is concerned with an analysis of the structural and institutional features of contemporary free market economies, with particular emphasis on the institutional characteristics which govern the distribution of income. It is further concerned with the institutions and policies set up by modern states in pursuance of redistributive social welfare schemes, or policies of growth and employment ("planning"), with particular reference to the experience of Great Britain, Sweden, France and other countries. (Half course.)

### 701 - Economics 446. Welfare Economics

Prerequisites: Economics 211, 411. An introductory study of the concepts, assumptions and propositions of theoretical welfare economics. A brief review of the welfare propositions inherent in the writings of classical and neo-classical economists, followed by a study of Pigovian welfare economics and the "new" welfare economics associated with the names of Pareto, Hicks, Bergson and others. (Half course.)

### 701 - Economics 451. Money and Banking

Prerequisite: Economics 211. A general study of the modern theory of income determination and of the principles of commercial and central banking. In particular, the course will deal with the nature and functions of money, national income accounting; some aspects of modern monetary theory, monetary and fiscal policy, commercial and central banking as an instrument of monetary policy, the structure and mechanism of the modern money market, foreign exchange and the problem of inflation. Special emphasis will be laid on monetary and banking problems in Canada. (Full course.)

NOTE:—Students who have credit for Economics 251 or 452 may not take this course for credit.

### 701 - Economics 452. Macroeconomic and Monetary Theory

Prerequisite: Economics 211. A basic course in macroeconomic and monetary theory; with particular reference to the role of monetary institutions and monetary policies. (Full course.)

NOTE:—This course is intended primarily for students honouring and majoring in Economics. Others should take Economics 451.

Students who have credit for Economics 251 or 451 may not take this course for credit.

### 701 - Economics 453. Economic Fluctuations

Prerequisites: Economics 211; 451 or 452. A survey of theories advanced to explain economic fluctuations in industrial economies and a discussion of monetary, fiscal and other policies that may be used to mitigate such fluctuations. (Full course.)

NOTE:—Only one full credit will be given from among Economics 441, 442, and 453.

### 701 - Economics 454. Public Finance and Fiscal Policy

Prerequisite: Economics 211. A general study of the principles and practice of government finance; taxation powers and practice in Canada by the federal, provincial and municipal governments; taxation theories; the use of the budget to influence the economy; techniques of deficit and surplus finance; the public debt. (Full course.)

### 701 - Economics 461. International Economic Relations

Prerequisite: Economics 211. A study of the background and development of contemporary international economic problems. The balance of payments and the various equilibrating mechanisms. The theory and operation of the gold standard. World War I and its aftermath: reparations and war debts; inflation; the restoration of the gold standard and its eventual collapse, the experience of the 1930's. Postwar international institutions: IMF, GATT, etc. The stages of recovery. European integration and the common market. The sterling system and convertibility. European clearing systems. Today's gold exchange standard. (Full course.)

NOTE:—Students who have credit for Economics 261 may not take this course for credit.

### 701 - Economics 462. Theory of International Trade

Prerequisites: Economics 211, 411, 461. A study of the theories of comparative costs and reciprocal demand and their development; the theory of factor reward equalization; the theory of foreign exchanges; the theory of tariffs; customs union theory, and related topics in the theory of international trade. Emphasis will be placed upon the theoretical rather than the institutional analysis of international economics, though the theories will be illustrated by consideration of current problems in international economic affairs. (Full course.)

### 701 - Economics 482. Introduction to Econometrics

Prerequisites: Mathematics 251 and Quantitative Methods 242, or Mathematics 441, or equivalent. This course will introduce the theory of econometrics. It will include an examination of the linear normal regression model and such problems as errors in variables, autocorrelation, multicollinearity, identification. Lectures and practice period. (Full course.)

### 701 - Economics 484. Mathematical Models in Economics

Prerequisites: Mathematics 251 or equivalent; one of Economics 411, 451 or 452. An examination of static and dynamic economic models including applications of differential and difference equations. Lectures and practice period. (Half course.)

NOTE:—Students who have credit for Economics 483 may not take this course for credit.

### 701 - Economics 485. General Equilibrium Analysis

Prerequisites: Mathematics 251 or equivalent; one of Economics 411, 451 or 452. An introduction to general equilibrium analysis, including applications of matrix algebra. Lectures and practice period. (Half course.)

NOTE:—Students who have credit for Economics 483 may not take this course for credit.

## EDUCATION

John MacDonald, *Professor of Education.*
Mark Braham, *Assistant Professor of Education.*

### 702 - Education 211. History of Education

An examination of the historical, social, and comparative foundations of educational practice. (Full course.)



### 702 - Education 221. Adult Education

This course is intended for all who are interested in adult education, whether professionally concerned with it or not. The history, organization, philosophy, and problems of adult education both formal and informal will be discussed with particular emphasis upon the current developments in Canada. (Half course.)

### 702 - Education 231. Education in Canada

Federal and provincial organization and administration with primary consideration given to the historical development of Quebec's public school system, and to Quebec school law. (Half course.)

### 702 - Education 411. Philosophy of Education

Relationship of philosophical concepts and orientations to educational practices. (Full course.)

### Cognate Course

See also **Psychology 223. Educational Psychology.**

## GEOGRAPHY

Harry A. Clinch, *Associate Professor of Geography and Chairman of the Department.*
Ronald W. Bryant, *Associate Professor of Geography.*
Michael Marsden, *Assistant Professor of Geography.*
Brian Slack, *Assistant Professor of Geography.*
Morris L. Wood, *Lecturer in Geography.*
James W. Young, *Lecturer in Geography.*
Bogdan Zaborski, *Visiting Professor of Geography.*

### 703 - Geography 211. Introduction to Human Geography

Considers the earth as the home of man. A general introduction to geography, which is intended to encourage an appreciation of the relationship existing between physical and cultural distributions over the earth's surface. This course will be concerned with man-land relationships. The broad global patterns of climate, vegetation, relief, soils, and natural resources will be reviewed. The use of maps, charts, diagrams, on the part of the students will be encouraged. Area studies will be introduced from time to time to illustrate the role of geography. Each student will be responsible for a term paper describing, accounting for, and explaining the distribution of population within some given area. (Full course.)

### 703 - Geography 221. Geography of the Oceans

A general study of the world's oceans from a physical, biological, and human point of view. (Full course.)

### 703 - Geography 231. Introduction to Physical Geography

An introduction to the earth sciences as they relate to the environment of man, with special emphasis upon weather, climate and the evolution of landscape. (Full course.)

NOTE:—Students who have credit for Geography 232 may not take this course for credit.

### 703 - Geography 251. Economic Geography

This course deals with the way in which geographic conditions influence, and have influenced, the products, the occupations, and the ways of life of the various peoples of the world, and provides an understanding of the natural resources of the world, and the geographical factors which affect their exploitation, transportation and use in the satisfaction of wants. (Full course.)

### 703 - Geography 261. General Cartography

A general study of the map as the tool of the geographer. The course will include a history of cartographic development from the earliest times to the present. Emphasis will be placed on map scale; map projection; map symbolism; map reading and usage. The use and interpretation of ground and air surveys and such cartographic specialities as diagrams, statistical maps, cartograms, globes and models. Exercises and assignments of a practical nature involving the construction of maps will be expected from all students enrolled. (Full course.)

### 703 - Geography 411. Historical and Political Geography of Europe

Prerequisite: Geography 211 or History 213. An historical and political survey of Europe with emphasis on the development of Western European nations from the earliest time to the present. In the modern period emphasis will be placed on the geography of current events and geopolitics. (Full course.)

### 703 - Geography 412. World Political Geography

Prerequisites: Geography 211 and 251; or 411. A basic study of the concepts of political geography. These concepts will be developed by a series of case studies on particular states and boundary problems. (Full course.)

### 703 - Geography 421. Historical and Political Geography of the United States

Prerequisites: Geography 211 or 251, or History 251. A survey of exploration, colonization and settlement patterns in the United States. Sectional and regional divisions within the United States, their expression in the internal politics of the United States, and the geopolitical position of the United States in the modern world will be examined. (Full course.)

### 703 - Geography 422. Historical and Political Geography of Quebec and Ontario

Prerequisites: Geography 211 or 251; 261, 441. A study of a historical nature of past geographic patterns—economic, social, cultural and political in Quebec and Ontario. (Full course.)

### 703 - Geography 431. Urban Geography

Prerequisites: Geography 211 or 251; 441. A study of the prehistoric town, the Greek and Roman town, towns in the Middle Ages, the trading city, the pioneer town and the modern metropolis. The distribution of such towns, their development, growth and internal pattern of organization will be looked at from an historical and geographical point of view. Problems of conurbations and large metropolitan cities in the present age will be discussed and evaluated. Special emphasis will be given to Canadian cities, to their site, function, organization, growth and development as well as to urban problems relating to zoning, transportation, urban renewal, etc. (Full course.)

### 703 - Geography 432. World Frontiers of Settlement

Prerequisites: Geography 211, 251. A study of areas of the world where active settlement is being, or might be carried out. (Half course.)



### 703 - Geography 433. Canadian Frontiers of Settlement

Prerequisites: Geography 211, 251, 432, 441. A detailed study of the present day pioneer areas of Canada. (Half course.)

### 703 - Geography 436. Regional Studies

Prerequisites: two credits chosen from Geography 211, 251, 261, 441. The course will examine the nature of regions and the problems of delimiting their boundaries. Different types of geographical regions will be studied; physical, economic, social, cultural, political, and detailed case studies will be used as examples. The course will also outline some of the problems confronting the regional planner. (Full course.)

### 703 - Geography 441. Geography of Canada, Past and Present

A study of Canada, past and present based on the various natural regions into which the country is divided. In the first half of the course an historical-geographic approach will be taken to bring to the student's attention the main trends in Canadian cultural and historical development from aboriginal times to the present. The changing nature of man-land relationships at different periods of time, and under different forms of occupance will receive particular attention. In the second half of the course the present day pattern of human occupance on a regional and national basis will be analyzed. Special studies on regional problems and on particular economic, social, or political lines of general interest will be included in the course. All students will be expected to complete a term paper for credit. (Full course.)

NOTE:—Students who have credit for Geography 241 may not take this course for credit.

### 703 - Geography 443. Geography of the U.S.S.R.

Prerequisite: Geography 211 or 251 or equivalent. A regional study of the U.S.S.R. covering physical, economic, social and cultural distributions. (Full course.)

### 703 - Geography 444. Polar Lands

Prerequisites: Geography 211 or 231. A regional study of the Arctic and Sub-Arctic areas with some reference to Antarctic conditions. The physical environment, history of exploration and settlement, resources and transportation networks are described in some detail, but there is an emphasis upon study of the northlands as a series of relatively simple case histories with lessons which may be applied in any underdeveloped area. (Full course.)

### 703 - Geography 445. Study of a Selected Region

Prerequisites: Geography 211 or 251. A study of the physical, economic, social and cultural patterns of a selected region. This course will emphasize present day problems. Different areas will be dealt with from year to year, selected from the Indian Peninsula, South East Asia, China, and the Caribbean. (Full course.)

### 703 - Geography 451. Prehistoric Geography of Europe, Asia and Africa

Prerequisites: Geography 211 or History 211. This course will deal with the basic environmental archaeology of early man. A direct scientific scrutiny of the primary importance of changing geographic factors on the distribution, evolution, migration, occupance patterns, subsistence and social life of early man. The course has three main sections—early food gathering man, the first farming and the growth of civilizations. (Full course.)

### 703 - Geography 456. Advanced Economic Geography

Prerequisite: Geography 251 or equivalent. This course examines factors affecting the location of industries and industrial regions, and outlines the various theories of industrial location. Case studies of particular industries will be used as illustrations. In the second term, study will focus on the factors accounting for the distribution of energy industries, and the varied consumption patterns of hydro power and major fuels. (Full course.)

### 703 - Geography 457. Resource Utilization and Conservation

Prerequisite: Geography 251. The resource concept and concepts of conservation. The regional approach to resource management. Case studies of the problems in developing particular natural resources and of interstate areas of poor economic health, with emphasis on the regional and natural parts of such developments. Special emphasis will be given to Canadian problems and those of selected underdeveloped countries. (Full course.)

### 703 - Geography 461. History of Geographical Thought

Prerequisites: Geography 211 and one additional credit in Geography. A study of the development of the field of geography from ancient times down to the present. Representative geographical works of the Greeks, the Romans, and of the Middle Ages. The Age of Discovery, the 19th and the 20th centuries will be examined and discussed. The present day concepts of the field and function of geography will receive special attention. (Half course.)

### 703 - Geography 466. Advanced Cartography

Prerequisite: Geography 261. Advanced techniques in map and diagram making and usage related to all aspects of human and physical geography, with special emphasis on the practical solution of cartograhpic problems. Practice periods and assignments. (Full course.)

### 703 - Geography 471. Plant and Animal Geography

Prerequisites: Geography 211; or 231 and 232; or 251. A study of past distribution and dispersal of plants and animals with emphasis upon their present pattern of geographic distribution. (Full course.)

NOTE:—Beginning in 1968-69, the prerequisite for this course will be Geography 211 or 231 or 251.

### 703 - Geography 472. Advanced Geomorphology

Prerequisite: Geography 231; Geography 232 or Geology 211. A detailed study of Pleistocene Epoch during both glacial and interglacial times, with special reference to the detailed effects that can be observed in the present day landforms of Quebec and Ontario. (Half course.)

NOTE:—Beginning in 1968-69, the prerequisite for this course will be Geography 231 or Geology 211.

### 703 - Geography 473. Advanced Climatology

Prerequisite: Geography 231. This course will provide an insight into the dynamic controls of climatic environment and into methods of evaluating the past and present climatic effects. Past climatic changes are demonstrated from a great variety of evidence in our present environment. There is a strong emphasis upon the many applications in fields other than geography of both the methods used and the knowledge obtained. (Full course.)

### 703 - Geography 491. Honours Essay

Prerequisite: open to fourth-year Honours students, or by permission of the department. Each student must prepare and submit an appropriate research paper, under the supervision of the department. (Full course.)



## HISTORY

E. E. McCullough, *Professor of History, and Chairman of the Department.*
Martin D. Lewis, *Associate Professor of History.*
Alan H. Adamson, *Assistant Professor of History.*
Walter J. Ausserleitner, *Assistant Professor of History.*
Frank A. Chalk, *Assistant Professor of History.*
J. Cameron Nish, *Assistant Professor of History.*
Stephen J. Scheinberg, *Assistant Professor of History.*
Irving H. Smith, *Assistant Professor of History.*
Robin B. Burns, *Sessional Lecturer in History.*

400 - level courses should be attempted only by those who have had one or more courses at the introductory level.

### 704 - History 211. History of Ancient and Medieval Civilization

The story of early mankind is outlined, and the origins of the great civilizations of Europe and Asia are studied. After surveying the classical civilizations, the course concludes with a study of the medieval period. (Full course.)

NOTE:—This course does not fulfill prerequisite requirements for advanced courses in History.

### 704 - History 213. History of Europe in the Modern World

A survey of European civilization from the 15th century to the present day. An attempt is made to present an integrated picture of all aspects of European cultural in the period of its rise to a dominant position in the world. (Full course.)

### 704 - History 221. History of Canada Since 1534

A study of the growth of Canada from the age of exploration to the present time. Emphasis is placed on the political, economic and cultural developments which are of significance in the understanding of the problems of today. (Full course.)

### 704 - History 251. History of the United States

This course deals with the growth of the United States from the time of discovery to the present time. The character of the population, the government, and the various voluntary political and labour organizations is studied from an historical point of view. Special attention is paid to the development of foreign policy and to the present position of the country in world affairs. (Full course.)

NOTE:—Students who have credit for History 451 may not take this course for credit.

### 704 - History 261. Asia, Africa and the West

A survey of the history of Asia and Africa in modern times, stressing the interaction between the indigenous civilizations of these continents and that of the West, and the inter-relationships between developments in Eastern and Southern Asia, the Middle East, and Africa. (Full course.)

NOTE:—Students who have credit for History 461 or 462 may not take this course for credit.

### 704 - History 413. History of European Diplomacy, 1870-1939

Prerequisite: History 213 or Political Science 421. This course is a study of the events leading up to the First World War, of the diplomacy of the war itself, and of the truce which culminated in the second outbreak in 1939. (Half course.)

### 704 - History 414. History of the Renaissance

Prerequisite: History 212 or 213. A study of world history in the period of the European Renaissance 1450-1700. (Full course.)

### 704 - History 415. The Rise of Science and Industry

Prerequisite: History 213. A study of the origins and course of the scientific and industrial revolutions. (Full course.)

### 704 - History 416. The Age of Nationalism, 1789 to the Present

Prerequisite: History 213. An intensive study of the internal development and external relations of the national states since the French Revolution. (Full course.)

### 704 - History 422. History of New France, 1534-1760

Prerequisite: History 213 or 221. An intensive study of Canada during the colonial regime. It will be of benefit to students if they have completed French 211 before taking this course. (Full course.)

NOTE:—Students who have credit for History 222 may not take this course for credit.

### 704 - History 423. History of British America, 1760-1867

Prerequisite: History 213 or 221. An intensive study of Canada from conquest to confederation. (Full course.)

### 704 - History 424. History of Canada Since 1867

Prerequisite: History 213 or 221. An intensive study of the political, economic and cultural development of Canada since Confederation. (Full course.)

### 704 - History 425. Reading Course in the History of the Americas

Prerequisites: History 472 previously or concurrently, and written permission of the History Programme Advisor. Prescribed readings in a period of Canadian, American or Latin American history. No lectures; consultation only. (Half course.)

### 704 - History 426. History of Quebec, 1759-1965

Prerequisite: History 221 or 424 previously or concurrently. An intensive study of Quebec since its conquest by the English. While due importance will be devoted to the political history of Quebec, the purpose of the course is to provide a study in depth of the social, economic and cultural institutions of Quebec. (Full course.)

### 704 - History 431. History of Britain, 1485 to the Present

Prerequisite: History 212 or 213; students honouring in English may register without prerequisite. A survey of the political, economic, and social development of modern England. Emphasis is placed on the evolution of parliamentary government in the early period, on the economic changes of the eighteenth and nineteenth centuries, and on the modern growth of democracy and the social service state. (Full course.)

NOTE:—Students who have credit for History 231 may not take this course for credit.

### 704 - History 432. History of the British Empire and Commonwealth

Prerequisite: History 213. The development of the Empire and Commonwealth is surveyed from the American Revolution to the present time. Emphasis is placed upon the forces which promoted the growth of the Empire in the nineteenth century and the influences which have transformed it in the twentieth century into the Commonwealth of Nations. (Half course.)



### 704 - History 433. Reading Course in European and World History

Prerequisites: History 472 previously or concurrently, and written permission of the History Programme Advisor. Prescribed readings in a period of European, Asian or African history. No lectures; consultation only. (Half course.)

### 704 - History 441. History of Russia

Prerequisite: History 213. This course traces the origin of the Slavic-speaking peoples in Europe and the emergence of the Russian Empire. It discusses the ideology and history of bolshevism, and the period under communist government in the U.S.S.R. and among the Slavic peoples. (Full course.)

### 704 - History 442. History of Modern France and Germany

Prerequisite: History 213. A study of the political, social and intellectual history of France and Germany since the beginning of the 18th century. (Full course.)

### 704 - History 452. History of Latin America

Prerequisite: History 213. This course deals with the political, social and economic history of Latin America from the founding of the Spanish Empire to the present day. The development of the principal independent republics is studied, and attention is given to the growth of Inter-Americanism and to the place of Latin America in the modern world. (Full course.)

### 704 - History 453. History of Colonial America

Prerequisite: History 213 or 221. A comparative survey of the Spanish and English empires in America from the age of exploration to the end of the colonial regimes. Political, social and economic developments will be studied in their relation with those of the other colonies and with the later growth of the societies concerned. (Full course.)

### 704 - History 454. Inter-American Relations: Canada and the United States

Prerequisite: History 221 or 251 or 451. A study of the political, economic, and cultural relations of Canada and the United States between the American Revolution and the present time. (Half course.)

### 704 - History 455. Foreign Relations of the United States

Prerequisite: History 213 or 251 or 451. A study of United States foreign policy from the revolution to the present time, with emphasis on the period since 1890. (Full course.)

### 704 - History 456. History of the United States Since 1900

Prerequisite: History 213 or 251 or 451. This course deals with domestic developments in the United States in the twentieth century, including politics, intellectual life, industry and labour. (Full course.)

### 704 - History 457. The Jacksonian Era in the United States

Prerequisite: History 213 or 251. The development of American political, social and economic life in the early decades of the 19th century. (Half course.)

### 704 - History 458. Civil War and Reconstruction in the United States

Prerequisite: History 213 or 251. Sectionalism and expansion in the middle decades of the 19th century, the characteristics of plantation slavery as a social system, the coming of the Civil War, and the aims and outcome of Reconstruction. (Half course.)

### 704 - History 461. History of South and Southeast Asia

Prerequisite: History 213 or 261. A study of the historical background of India, Pakistan, and the states of Southeast Asia. The course begins with a review of indigenous developments prior to the era of European expansion and proceeds to a more detailed examination of the political, social, and economic changes in modern times, concluding with a study of the problems faced by these countries since the achievement of independence. (Full course.)

### 704 - History 462. History of East Asia

Prerequisite: History 213 or 261. The course begins with a review of the traditional societies of China and Japan, and then examines the contrasting response in the two lands to the impact of Western imperialism in the nineteenth and twentieth centuries, concluding with a study of developments since the Second World War. (Half course.)

### 704 - History 471. Philosophy of History

Prerequisites: History 472, and written permission of the History Programme Advisor. This course surveys the development of historical writing from ancient times to the present, with special emphasis on the various modern schools of historical philosophy and on the growth of criticism. (Full course.)

### 704 - History 472. Historical Method

Prerequisites: at least two credits in History, and written permission of the History Programme Advisor. A course in the application of modern historical criticism to a specific problem to be chosen in consultation with the instructor. (Full course.)

### 704 - History 473. Advanced Study in a Special Subject

Prerequisite: permission of the department. This course, intended primarily for Honours or major students, affords an opportunity for more intensive examination of a particular historical theme than is possible in the normal lecture course. The specific subject will vary according to the special interests of the professor offering the course in any given year. (Full course.)

### 704 - History 481. History of Africa

Prerequisite: History 213 or 261. A survey of the early history of Africa followed by a more intensive study of the past century. Special emphasis is given to the changes in Africa resulting from contact with European civilization. (Full course.)

### 704 - History 493. History and Sociology

Prerequisites: an introductory course in History and in Sociology, and third or fourth-year standing. An exploration of the relationships between historical and sociological approaches to the description and analysis of social conditions and social events, paying special attention to questions of methodology and conceptualization. (Full course.)

NOTE:—This course will be given *only* in the Special Summer Session in Sociology and History, 1967.

### 704 - History 494. The Rise of Industrial Society in America

Prerequisite: History 213 or 251, or Sociology 211. An examination of the nature of industrial society in America and its relation to the problem of alienation. The last half of the course will consist of an intensive case study of the Populist movement in America as a response to industrial transformation. (Full course.)

NOTE:—This course will be given *only* in the Special Summer Session in Sociology and History, 1967.



### 704 - History 495. American Urban History

Prerequisite: History 213 or 251, or Sociology 211. A study of the dynamic character of urbanization in the United States and the role of the American city in the broader course of American history. (Half course.)

NOTE:—This course will be given *only* in the Special Summer Session in Sociology and History, 1967.

### Cognate Course

### 614 - Classics 211. History of Greece and Rome

A political, cultural and social history of Greece and Rome from the Mycenaean Age to the Fall of the Roman Empire, with special emphasis on fifth century Athens and Rome of the Republic and Early Empire. (Full course.)

## POLITICAL SCIENCE

H. F. Quinn, *Professor of Political Science, and Chairman of the Department.*
Klaus J. Herrmann, *Associate Professor of Political Science.*
Harold M. Angell, *Assistant Professor of Political Science.*
Paris J. Arnopoulos, *Assistant Professor of Political Science.*
Robert A. Fraser, *Assistant Professor of Political Science.*
Leslie Laszlo, *Assistant Professor of Political Science.*

### 705 - Political Science 211. Introduction to Political Science

A study of the origin and nature of the State, and the relation of the individual to it. The course will deal with the nature and interpretation of law, constitutions, division of powers of government, organization of political parties, formation of public opinion, the function of parliaments, the different types of cabinet and presidental systems, federalism, and problems of public administration. (Full course.)

### 705 - Political Science 251. Government and Politics of Canada

A study of the British North America Act and its judicial interpretation; the nature of Canadian federalism; the parliamentary system; nature and organization of political parties; provincial and municipal governments; law and the courts; foreign policy. (Full course.)

### 705 - Political Science 291. Elements of Law

This course is designed to provide students with an elementary knowledge of those institutions and problems of law with which they may reasonably be expected as citizens to have some understanding and appreciation. As a background to this study the meaning of law and its various divisions will be treated with a view to relating the legal order to present day problems of society. Topics will include the organization and functioning of the Federal and Provincial court systems including the appointment and selection of the Judiciary; the various stages in a lawsuit; a brief consideration of the Quebec civil law as it affects questions of marriage and the more common contracts such as sale, lease and partnership. (Full course.)

### 705 - Political Science 411. Political Parties

Prerequisite: Political Science 211. A study of the history, ideology, organization and electoral geography of political parties in the United States, England, France, Germany, and some of the smaller countries in Western Europe. The course will also deal with the different types of party systems, the nature and function of parties in the democratic process, the nature of political elites, pressure groups, the organization of elections, and political propaganda. Lectures, discussions and term paper. (Full course.)

Textbook: Neumann, *Modern Political Parties*.

### 705 - Political Science 413. Government of Russia

Prerequisite: Political Science 211 or History 213. A study of the Russian system of government including legislative, executive, and judicial branches; the role of bureaucracy; the Communist Party. Comparisons with Western systems of government. (Half course.)

### 705 - Political Science 414. Government of United States

Prerequisite: Political Science 211 or History 251 or History 451. A study of the American Constitution, federalism and the electoral system. (Half course.)

### 705 - Political Science 415. Asian Political Systems

Prerequisite: Political Science 211. A comparative study of the origins and characteristics of the political systems of Asia with particular attention to India, Pakistan, China and Japan. (Full course.)

### 705 - Political Science 416. Government of France

Prerequisite: Political Science 211 or History 213. A study of the legislative, executive, judicial and party systems of the Fourth and Fifth Republics. Some attention will also be given to French political institutions prior to World War II. (Half course.)

NOTE.—Students who have credit for Political Science 412 may not take this course for credit.

### 705 - Political Science 417. Government of Germany

Prerequisite: Political Science 211 or History 213. A study of the legislative, executive, judicial and party systems of the German Federal Republic. Some attention will also be given to the political institutions of Eastern Germany and the government of Berlin. (Half course.)

NOTE.—Students who have credit for Political Science 412 may not take this course for credit.

### 705 - Political Science 421. International Political Relations

Prerequisite: Political Science 211. This course will deal with the following topics: the rise of the Western state-system; nationalism and national sovereignty; imperialism and the balance of power; power politics in war and peace; internationalism and international organizations; international law and international government. Through lectures and class discussions the student will gain some knowledge of the complex pattern of international relations which will serve as a basis for evaluating current events in the modern world in which we live. (Full course.)



### 705 - Political Science 422. International Organization

Prerequisite: Political Science 211. The historical development of the concepts of international organization with special emphasis upon the 19th and 20th centuries. The League of Nations and the United Nations with its specialized agencies will be examined carefully. In addition, certain other international bodies of a regional or specialized nature such as N.A.T.O. and G.A.T.T. will be considered. (Full course.)

NOTE:—Only one full credit will be given from between Political Science 221 and 422.

### 705 - Political Science 431. History of Political Theory

Prerequisite: Political Science 211 or Philosophy 211. A critical study and analysis of the great thinkers on the problems of politics; Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau, Hegel, Bentham, Mill and others. This course is designed to give a survey of systematic political reasoning from the classical period up to the middle of the 19th century in an endeavour to show the foundations of modern political thought. (Full course.)

### 705 - Political Science 432. Modern Political Theories

Prerequisites: Political Science 211 or Philosophy 211; Political Science 431. This course will cover political theories of the 19th and 20th centuries, dealing with such ideologies as Liberalism, Conservatism, Marxism, Democratic Socialism and Fascism. Readings include selections from the writings of Paine, Burke, Green, Marx, Lenin, Bernstein, Mussolini, Hitler, Mao Tse-tung, and others. (Full course.)

### 705 - Political Science 433. Political Analysis and Methodology

Prerequisites: Political Science 211, and one additional credit in Political Science. A study of the new methods and techniques being used in Political Science today. The course will deal with the possibilities and limitations of the historical, institutional, functional, behavioural and general systems approaches. Attention will also be paid to voting analysis, policy and decision making, group theory, game theory, statistical methods, and such concepts as political culture and politicization. (Full course.)

### 705 - Political Science 441. Problems of Public Administration

Prerequisite: Political Science 211. This course deals with the nature and function of the administrative branch of government. The student is introduced to such problems as the proper organization of government departments, the management of government corporations, budgeting, selection and training of personnel, maintenance of morale and discipline, relationship between legislature and administration, relationship between the administration and the public. (Full course.)

### 705 - Political Science 451. Canadian Federalism

Prerequisite: Political Science 251. A critical and analytical study of the theory of federal government and its application to the nature, principles and techniques of federalism in Canada. The reaction of the Canadian federal system to the demands of cultural dualism and regional pressures. Some attention will also be given to the problems of provincial governments in their pressure on and adjustment to Dominion-Provincial relations. (Half course.)

### 705 - Political Science 491. Honours Seminar

Prerequisite: open to fourth year Honours students, or by permission of the department. Students will choose a topic from one of the various fields in political science. Each student must prepare and submit an appropriate research paper, under the supervision of the department. (Full course.)

## PSYCHOLOGY

G. M. Mahoney, *Professor of Psychology, and Chairman of the Department.*

A. Harold Goldsman, *Associate Professor of Psychology.*
Jane Stewart, *Associate Professor of Psychology.*
Joseph P. Zweig, *Associate Professor of Psychology.*
Gabriel R. Breton, *Assistant Professor of Psychology.*
William L. Gardiner, *Assistant Professor of Psychology.*
William R. Hooper, *Assistant Professor of Psychology.*
Phyllis Kasper, *Assistant Professor of Psychology.*
Tannis Y. Maag, *Assistant Professor of Psychology.*
George R. Marshall, *Assistant Professor of Psychology.*
Erat S. Nayar, *Assistant Professor of Psychology.*
June S. Chaikelson, *Lecturer in Psychology.*
Nancy D. Taylor, *Lecturer in Psychology.*
Edgar B. Zurif, *Lecturer in Psychology.*

### 706 - Psychology 211. A General Study of Mind and Behaviour

The purpose of this course is the development of an adequate understanding of human behaviour and experience. The work includes a study of the sense organs and nervous system, perception, learning, memory, motivation and the basic needs, emotional reactions, personality development, adjustment and integration, abnormal personality, mental abilities and aptitudes, and the application of psychological findings to the problems and activities of everyday life. This course is prerequisite to all other courses in psychology. (Full course.)

### 706 - Psychology 221. Industrial Psychology

Prerequisite: Psychology 211. The application of psychological principles to business and industry. (Full course.)

### 706 - Psychology 223. Educational Psychology

Prerequisite: Psychology 211. The application of psychological principles to problems of teaching, learning and education in general. (Full course.)

### 706 - Psychology 225. Psychology and Crime

Prerequisite: Psychology 211. A specialized course in the application of psychology to problems of legal procedure, crime and punishment. The course includes the study of the psychology of the judge, the jury, the witness, the police and the criminal. Discussion of the social and psychological factors contributing to crime and delinquency, and consideration of the various penal methods also is included. (Half course.)

### 706 - Psychology 231. Child Development

Prerequisite: Psychology 211. A survey of biological and social development of the child from infancy to maturity. The course will include discussion of physical, mental, and social age norms, the results of experimental, clinical, and psychometric investigations, and the application of scientific findings in the care and training of children. (Full course.)

### 706 - Psychology 241. Statistical Methods for Psychology and Education

Prerequisite: Mathematics 213 or 251 or high school Algebra. A basic course in the fundamentals of statistics for psychology and education. Lectures and laboratory. (Full course.)

NOTE:—Only one full credit will be given from among Economics 481, Mathematics 241, Quantitative Methods 242, Statistics 242, Social Science 241, Sociology 241, and Psychology 241.



### 706 - Psychology 412. Advanced General Psychology

Prerequisite: Psychology 211. This course makes a more detailed study of general, physiological, and individual psychology. The work includes an outline of the history of psychology, the various schools of psychological thought and their historical background, psycho-analysis, and individual differences, normal and abnormal. (Full course.)

### 706 - Psychology 413. Contemporary Theories and Systems

Prerequisites: Psychology 211, 461. An intensive treatment of current theoretical systems. (Full course.)

### 706 - Psychology 421. Learning and Motivation

Prerequisite: Psychology 211. An analysis of phenomena such as conditioning, more complex forms of learning, forgetting, transfer, instinctive behaviour, motivation, and emotion. (Full course.)

### 706 - Psychology 427. Appraisal of Tests and Measurements

Prerequisites: Psychology 211, 241. A course in the construction and appraisal of tests and other measurements and procedures, as used in the study of individuals and groups for such purposes as vocational guidance, social psychological research into attitudes, prejudices, and the like, and in the conduct of other types of psychological research. Lectures, demonstrations and seminar periods. (Full course.)

### 706 - Psychology 431. Perception and Thinking

Prerequisite: Psychology 211. An analysis of phenomena such as perception, attention, discrimination, perceptual constancy, perception of distance, movement, problem-solving, concept-formation. A consideration of the nature of perceptual and thinking processes. (Full course.)

### 706 - Psychology 441. Social Psychology

Prerequisite: Psychology 211. A study of the individual in his socio-psychological environment, the cultural and hereditary determinants of behaviour, the uniformities and variations among human beings, sex and race differences as determined by cultural patterns, the social significance of language, social interaction, attitudes, stereotypes, propaganda, race prejudice, public opinion and morale, group dynamics and sociometry. (Full course.)

### 706 - Psychology 451. Personality and Mental Hygiene

Prerequisite: Psychology 211. The course deals with the nature of personality, the correlation of mental characteristics with physical traits, bodily form and expressive movements, the analysis of intellect, temperament and character, the integration and development of personality and its relation to the patterns of culture, theories of personality, the problem of types, adjustment and resolution of conflict, personality tests, rating scales and inventories. (Full course.)

### 706 - Psychology 452. Abnormal Psychology

Prerequisites: Psychology 211, 451. A study of the etiology and description of behaviour and psychological disorders, including the psychoneuroses, psychoses and psychosomatic conditions. (Full course.)

### 706 - Psychology 461. Physiological Psychology

Prerequisite: Psychology 211. This course attempts to relate neurophysiology to such psychological problems as learning, attention, and emotion. The topics treated include excitation and conduction in the neuron; synaptic mechanism; sensory and motor systems; the internal environment; the electrical activity of the brain. Emphasis is given to brain damage studies in animals and man, and the problem of localization of function in the nervous system. (Full course.)

### 706 - Psychology 462. Comparative Psychology

Prerequisites: Psychology 211, 461 (unless exemption is granted by the instructor.) The comparative method in the study of psychological problems, the evolution of behavior and its mechanism from protozoa to man, discussion of tropisms, reflexes, instincts, needs, sensory capacities, learning, thinking, and feeling. (Half course.)

### 706 - Psychology 471. Experimental Psychology

Prerequisites: Psychology 241 and permission of the department. This course will deal with experimental procedures and related techniques in the study of perception, learning, motivation and thinking. Emphasis will be placed on critical analysis of experiments and the evaluation of theoretical ideas in the light of their results. Students will be required to prepare reports of the literature on specific topics, and to arrange and conduct demonstration experiments. Lectures and laboratory. (Full course.)

### 706 - Psychology 472. Advanced Experimental Problems

Prerequisite: open to fourth-year Honours students, or by permission of the department. Supervised investigation of special problems. Each student will be required to conduct an experimental study and to submit an appropriate research paper of the study, under the supervision of the department. Lectures and laboratory. (Full course.)

## SOCIOLOGY AND ANTHROPOLOGY

Hubert Guindon, *Associate Professor of Sociology, and Chairman of the Department.*

Harold H. Potter, *Professor of Sociology.*
Kurt Jonassohn, *Associate Professor of Sociology.*
Anatole Norman Klein, *Associate Professor of Anthropology.*
H. Taylor Buckner, *Assistant Professor of Sociology.*
Fernand Fontaine, *Assistant Professor of Sociology.*
Patricia Pajonas, *Assistant Professor of Sociology.*
Solomon J. Rawin, *Assistant Professor of Sociology.*
Leo F. Van Hoey, *Assistant Professor of Sociology.*
Graciela Duce, *Lecturer in Sociology.*
David K. Orton, *Lecturer in Sociology.*
Shirley I. V. Ciffin, *Sessional Lecturer in Sociology.*
Hannah S. Kreplin, *Sessional Lecturer in Sociology.*
Karl W. Kreplin, *Sessional Lecturer in Sociology.*

## SOCIOLOGY

### 707 - Sociology 211. Introduction to Sociology

Folkways, mores, role, status, institution, culture are the chief concepts discussed. Personality formation, personal disorganization and social change also are dealt with, as are theory, past and current research and historical background. (Full course.)

### 707 - Sociology 222. Crime

Theories about criminal behaviour; comparative studies; white collar crimes; relationship between social organization, culture and crime. (Half course.)



### 707 - Sociology 241. Statistical Methods for Sociology

Prerequisite: high school Algebra. An introductory course in descriptive and analytical statistical methods for students of sociology. Lectures and laboratory. (Full course.)

NOTE:—Only one full credit will be given from among Economics 481, Mathematics 241, Quantitative Methods 242, Statistics 242, Social Science 241, Psychology 241, and Sociology 241.

### 707 - Sociology 411. Techniques in Sociology

Prerequisites: Sociology 211, Social Science 241. This course deals with the design of research, the methods of data collection, and the techniques of analysis. A research project will be designed and carried out by the students. The emphasis will be on training for the critical reading of published research materials, as well as on training for graduate study. Lectures and laboratory. (Full course.)

### 707 - Sociology 421. Social Change

Prerequisite: Sociology 211. Theories of social change found in the works of leading nineteenth and twentieth century writers are examined. The facts of social change in different parts of the world as presented in current research, are used to test the adequacy of theory. A survey is made of the remedial measures developed to correct conditions of individual and group maladjustment. (Half course.)

NOTE:—Students who have credit for Sociology 221 may not take this course for credit.

### 707 - Sociology 422. Social Movements and Institutions

Prerequisite: Sociology 211. The nature and functions of social movements in general are studied. Specific cases include political, racial, and religious movements. The second half of the course deals with the nature and functions of institutions and the character of bureaucracy. (Full course.)

### 707 - Sociology 423. Classical Sociological Theory

Prerequisites: Sociology 211, and one additional credit in Sociology. Introduction to major theorists whose main works will be read and discussed. Emphasis will be on the classics up to about 1920, especially Comte, Spencer, Marx, Ward, Sumner, Mead, M. Weber, Simmel, Durkheim and Pareto. Lectures and seminar. (Full course.)

### 707 - Sociology 424. Contemporary Sociological Theory

Prerequisites: Sociology 211, and one additional credit in Sociology. The nature and principles of theoretical construction. Analysis of specific theories. Classical theories such as those of Durkeim, Simmel and M. Weber are included, but the emphasis is on contemporary theorists, especially Parsons, Merton, Homans, Coser and Goffman. Lectures and seminar. (Full course.)

### 707 - Sociology 425. Self and Society

Prerequisite: Sociology 211. Theories of symbolic interaction that have influenced sociological analysis, with special emphasis on the theories of John Dewey, G. H. Mead, Cooley, Burke, Royce, Gerth and Mills, and Blumer. Motivation is viewed in terms of the interplay between actors and social structures, and this approach is illustrated by reference to selected empirical studies. (Full course.)

### 707 - Sociology 427. Political Sociology

Prerequisite: Sociology 211. The social and normative structures of political institutions, including political parties; the relationship between political institutions and religious and economic institutions; the rise and fall of political ideologies, systems and institutions; the making and communication of policies; the rejuvenation of elites. Political attitudes and behaviour are analysed, as well as political socialization, interest and involvement. (Full course.)

### 707 - Sociology 433. Sociology of Deviance

Prerequisite: Sociology 211. The nature of deviant or marginal behaviour: legal and non-legal forms. Socialization to deviance; institutionalization of deviance; social control of deviance; structure and culture of deviance. Theories of deviant behaviour and their sociological, legal and practical implications. (Full course.)

NOTE:—This course will be given *only* in the Special Summer Session in Sociology and History, 1967.

### 707 - Sociology 441. The Modern Community

Prerequisite: Sociology 211. The physical and social characteristics of urban communities are studied with special attention paid to ecological patterns and ecological processes. Forms of adjustment, co-operation and control are included in these studies. (Half course.)

### 707 - Sociology 442. The Family

Types of mate selection and types of marriage. Theories about the history of the human family. Models of family structure and family interaction. Empirical studies. Illegitimacy, family planning, old age, divorce, and psychodrama are treated. Designed to guide students who may go on to graduate study, as well as students whose main objective is preparation for marriage. (Half course.)

### 707 - Sociology 443. Intergroup Relations

Prerequisite: Sociology 211. Concepts of race, ethnicity, racial prejudice are examined. Intergroup problems; the marginal man; the selective nature of migration. Studies of specific intergroup situations include regions outside North America. (Half course.)

### 707 - Sociology 444. Social Stratification

Prerequisite: Sociology 211. Systems of social differentiation are analyzed. Theories about their origins and consequences, and about degrees and types of mobility related to them, are discussed. The theories are applied to Canada and to the United States as well as to other societies. (Full course.)

### 707 - Sociology 461. Demography

Prerequisite: Sociology 211 or Economics 211 or Geography 211 or 441. This course consists of a brief survey of population theory and an introduction to the techniques of population analysis. It will cover the size, distribution, and composition of the population; changes in these characteristics; the relationship between population trends and social and economic conditions, with special reference to recent trends. (Half course.)



### 707 - Sociology 462. Area Studies in Demography

Prerequisite: Sociology 461. Demographic trends of Canada and the United States; interregional migration; demographic features of other areas for which data is available. Special emphasis on the relationship between economic development and demographic characteristic will be given where possible. (Half course.)

### 707 - Sociology 465. Industrial Sociology

Prerequisite: Sociology 211 or Psychology 441. This course presents a sociological approach to the study of work in modern industrialized society. It deals with occupations and professions, some characteristics of the labour force and the labour market, and an analysis of social interaction and its effects in occupational groups and work groups. (Full course.)

NOTE:—Students who have credit for Sociology 243 may not take this course for credit.

### 707 - Sociology 491. Honours Seminar

Prerequisite: open to fourth-year Honours students or by permission of the department. Students engage in a critical study of major sociological work, according to their interests. Before the end of the academic year a research paper must be completed and accepted by the department. (Full course.)

### 707 - Sociology 492. Special Seminar

Prerequisites: Sociology 211, 422, 424. Subject matter will vary from year to year to take advantage of the special interests of the seminar leader. This course will provide opportunities to senior students for discussion and advanced study. (Full course.)

### 707 - Sociology 494. Logic of Sociological Analysis

Prerequisites: Sociology 211; 411 or 423 or 424. This course is intended for fourth-year or Honours students. The basic structure of science is discussed and matched against the underlying methodological positions found in the works of some of the major sociologists. This seminar complements Sociology 411, 423, or 424. (Full course.)

### 707 - Sociology 496. Problems of Urbanization

Prerequisite: Sociology 211. Urbanization in historical perspective; the rural-urban continuum; migration, the selection and transformation of migrants, their integration and change in the urban environment; different types of urbanization; migrants as a link between city and village and the urbanization of the village. (Full course.)

NOTE:—This course will be given *only* in the Special Summer Session in Sociology and History, 1967.

### Cognate Course

See also **History 493. History and Sociology.**

## *ANTHROPOLOGY*

### 709 - Anthropology 211. Introduction to Anthropology

This course deals with the evolution of man and his culture during prehistory, the differentiation of races, family and kinship structures in simple and complex societies, and the religious beliefs and practices of ancient and modern primitives in selected parts of the world. (Full course.)

NOTE:—Only one full credit will be given students who pass Anthropology 211 and Sociology 231.

### 709 - Anthropology 411. The American Indian

Prerequisite: Anthropology 211 or Sociology 231. The principles of general anthropology applied in a survey course on the American Indians. The advent of man to America; early cultural developments and the differentiation of the various groups or tribes; the culture of the Mayas, Toltecs, Aztecs, Pueblos, Iroquois, Eskimos, Northwest coast tribes, Andean, and other early civilizations of North and South America; the cultural contributions of the Indian to Western civilization. (Half course.)

NOTE:—Students who have credit for Sociology 232 may not take this course for credit.

### 709 - Anthropology 421. African Peoples

Prerequisite: Anthropology 211 or Sociology 231. This course deals with family and kinship structures of selected regions; native political organizations, political organization during colonial periods; religious beliefs and practices. (Full course.)

## COMPUTER SCIENCE

Courses in Computer Science are offered in the Faculty of Engineering and are available as electives to Arts students. See page 209.

# Faculty of Science

## CURRICULUM FOR THE DEGREE OF BACHELOR OF SCIENCE

ADMISSION REQUIREMENTS: Requirements for admission to undergraduate standing in the Faculty of Science are found on Page 49.

Students preparing for the degree of Bachelor of Science will take 21 course credits as listed below. A full credit represents three hours of class work per week for a full academic year, with the required additional laboratory work. A three-hour course followed for one term only is therefore a half-course and represents a half credit.

### First Year Science (5 credits)

| | |
|---|---|
| I. TWO credits selected from: | Physics 211<br>Chemistry 211<br>Botany 211 and Zoology 222<br>Geology 211 |
| II. ONE credit: | Mathematics 213* |
| III. ONE credit: | Mathematics 223* |
| IV. ONE credit: | English 211** |

### Second Year Science (6 credits)

| | |
|---|---|
| I. ONE credit selected from: | English Literature |
| II. TWO credits selected from: | Humanities or Social Sciences |
| III. THREE credits selected from: | Faculty of Science |

* *Students who have completed high school Trigonometry and Intermediate Algebra with a grade of 65% or more may substitute Mathematics 233 and 451. Those who have credit for some, but not all of Mathematics 211, 221, and 231 should consult a member of the Mathematics Department on courses necessary to complete first year Mathematics requirements.*

***A student whose native language is not English should consult the statement on English requirements for non-English-speaking students on Page 48.*



### Third and Fourth Year Science (5 and 5 credits)

Students must take ten further credits through the two years, with a maximum of six credits in any one year. At least six of these ten credits must be selected from the Faculty of Science.

At least seven of the total of twenty-one credits required for the degree must be selected from courses at the "B" level (courses numbered in the 400's in the Announcement).

To be admitted to the third year, the student must have completed (or if an evening student, be in the process of completing) the requirements for the first and second years.

## MAJOR PROGRAMMES

A "major" is an approved sequence of at least six credits in a specific field, which may include certain approved courses in other closely related subjects. The term "major" as used by Sir George Williams University implies that the student has followed, within the requirements for the degree, a planned programme in a specific field. The level of scholarship required is the same as that for a general degree.

Any student wishing to major must consult the chairman of the department concerned before planning a course sequence, and present to the Registrar a statement signed by the appropriate chairman authorizing him to register for studies in the major field. It is recommended that such consultation take place during a student's second year, or before commencing the third year.

If necessary, the requirements for a major may be completed after graduation.

## REQUIREMENTS FOR MAJORS

### Biochemistry

The following courses, in an approved sequence, constitute a major in Biochemistry:

| | |
|---|---|
| First year: | First-year Science with Chemistry 211 and Physics 211. |
| Second year: | Chemistry 221 or 421, 231; Botany 211*, Zoology 222*; Mathematics 451. |
| Third year: | Chemistry 441, Zoology 431. |
| Fourth year: | Chemistry 442, Chemistry 443. |

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Chemistry department.

* *Half-course.*

### Biology

The following courses, in an approved sequence, constitute a major in Biology:

Botany 211, Zoology 222, Biology 241 or 442, Botany 411, Zoology 422 and three additional credits in Biology, Botany or Zoology.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

### Chemistry

The following courses, in an approved sequence, constitute a major in Chemistry:

First year: First-year Science with Chemistry 211 and Physics 211.
Second year: Chemistry 231, 411*, 412*, 421; Mathematics 451.
Third and fourth years: Chemistry 415, 417*, 427*, 432, 490 and one full credit in Chemistry.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Chemistry department. Students should make application after completing second year.

### Mathematics

The following courses, in an approved sequence, constitute a major in Mathematics:

Mathematics 450 or 451, 431, 411, 440 or 441; three and one-half additional B-level credits in Mathematics, excluding Mathematics 442 and 446.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

### Mathematics (Statistics Option)

The following courses, in an approved sequence, constitute a major in Mathematics (Statistics Option):

Mathematics 450 or 451, 431, 411, 441, 442, Computer Science 471*.

One of Mathematics 452, 457, 459.

One of Mathematics 444, 446.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the department.

* *Half-course.*



### Physics

The following courses, in an approved sequence, constitute a major in Physics:

Mathematics 213 and 223 (or 233 by those qualified), 431, 451, 452. 457.

Physics 211, 222*, 232*, 440*, 441, 442*, 452, 453, 461, 491.

No student will be accepted for the major until a plan of study over the several undergraduate years has been approved by the chairman of the Department of Physics.

## REQUIREMENTS FOR HONOURS

The Science Departments offer Honours programmes wherein the student may concentrate on certain fields of study while maintaining a high level of academic performance. The regulations governing qualifications for an Honours degree are given on Page 76.

### Chemistry

The following courses constitute an Honours programme in Chemistry, provided the student maintains the required academic standing:

First year: First-year Science with Chemistry 211 and Physics 211.
Second year: Chemistry 231, 411*, 412*, 421; Mathematics 451. In addition, German 215 or Russian 215.
Third year: Chemistry 415, 417*, 427*, 432, 490; Mathematics 452. (A student honouring in Chemistry may take Mathematics 452 without Mathematics 431 as prerequisite).
Fourth year: Chemistry 416, 423*, 426*, 433, 450, 491.

### Mathematics

The following courses constitute an Honours programme in Mathematics, provided the student maintains the required academic standing:

Pattern A (for students entering without Intermediate Algebra and Trigonometry, or entering second year).

First year: Mathematics 213, 223.
Second year: Mathematics 411, 431, 451. (Properly qualified students entering second year will replace Mathematics 451 by 450).
Third year: Mathematics 441, 452, 458, 459.
Fourth year: Mathematics 461, 462, 463.
Third or Fourth years: Computer Science 471*, Mathematics 481*.

* *Half-course.*

Pattern B (for students entering with Intermediate Algebra and Trigonometry).

First year: Mathematics 233, 451.
Second year: Mathematics 411, 431, 452.
Third year: Mathematics 441, 458, 459.
Fourth year: Mathematics 461, 462, 463.
Third or
Fourth years: Computer Science 471*, Mathematics 481*.

## Mathematics (Statistics Option)

The following courses constitute an Honours programme in Mathematics (Statistics Option), provided the student maintains the required academic standing:

Pattern A (for students entering without Intermediate Algebra and Trigonometry, or entering second year).

First year: Mathematics 213, 223.
Second year: Mathematics 411, 431, 451. (Properly qualified students entering second year will replace Mathematics 451 by 450).
Third year: Mathematics 441, 452, 458, 459, Computer Science 471*.
Fourth year: Mathematics 442, 448. Two credits chosen from Mathematics 444, 446, 461, 462.

Pattern B (for students entering with Intermediate Algebra and Trigonometry).

First year: Mathematics 233, 451.
Second year: Mathematics 411, 431, 452.
Third year: Mathematics 441, 458, 459, Computer Science 471*.
Fourth year: Mathematics 442, 448. Two credits chosen from Mathematics 444, 446, 461, 462.

Note: (a) Students intending to go on to graduate work in Statistics should elect Mathematics 461 and 462 in fourth year.

(b) Students intending to go on to graduate work in Operations Research should elect Mathematics 444 and 462 in fourth year.

(c) Students desiring a more applied programme should elect Mathematics 444 and 446 in fourth year.

* *Half-course.*



## Physics

The following courses constitute an Honours Programme in Physics provided the student maintains the required academic standing:

Pattern A (for students entering without Intermediate Algebra and Trigonometry)

First year: Mathematics 213, 223; Chemistry 211 and in addition Physics 211 for students entering without high school Physics.
Second year: Mathematics 431, 451; Physics 222*, 232*, 440*, 442*, 452.
Third year: Mathematics 452, 457; Physics 441, 453, 461.
Fourth year: Mathematics 459; Physics 451, 471, 472, 491.

Pattern B (for students entering with Intermediate Algebra, Trigonometry and Physics).

First year: Mathematics 233, 451; Physics 222*, 232*; Chemistry 211.
Second year: Mathematics 431, 452; Physics 440*, 442*, 452.
Third year: Mathematics 457, 459; Physics 441, 453, 461.
Fourth year: Physics 451, 471, 472, 491.

It is strongly recommended that Honours students in Physics planning to do graduate work acquire a good reading knowledge of German or Russian.

## Zoology

The following courses constitute an Honours programme in Zoology, provided the student maintains the required academic standing:

First year: First-year Science with Botany 211*, Zoology 222*, and either Chemistry 211 or Physics 211.
Second year: Zoology 422. The introductory Science course (Chemistry 211 or Physics 211) not taken in the first year must be taken in either the second or third year.
Third and
Fourth years: Zoology 431 and four credits in Biology, Botany or Zoology at the '400' level chosen in consultation with the Biology department.

* *Half-course.*

## GRADUATE PROGRAMMES

Courses of study leading to the degree of Master of Science are offered and two programmes are available, Master of Science in Chemistry and Master of Science in Physics. Another course of study leads to the degree of Master in the Teaching of Mathematics. Courses are given in the late afternoon and evening, or in the evening only, making it possible for both day and evening students to attend.

### Residence Requirements

The minimum residence requirement for the completion of the degree is one full year's academic work as defined for each degree. This requirement must be met regardless of the amount of graduate work previously completed in any other programme or at any other university. The work for the degree must be completed within a period of five years from admission.

A full-time student is not permitted to engage in employment not directly related to his academic programme for more than ten hours per week. This includes teaching, demonstrating, marking, or work outside the university. A student who exceeds this amount of work must register as a part-time student.

### Financial Assistance

The National Research Council offers scholarships for graduate work in Science. In addition, various departments in the University offer salaries for teaching assistance, demonstrating, and marking. The amount of salary paid varies from department to department and depends upon the amount of work involved. Students who are interested in obtaining assistance should inquire from the department concerned.

## MASTER OF SCIENCE IN PHYSICS

### Admission

The requirement for admission is an Honours B.Sc. degree in Physics or its equivalent.

### General Requirements

1. Students who do not meet entrance qualifications may be permitted to make up their deficiencies.
2. A full-time student will spend a minimum of one academic year and may take a maximum of three full courses during the period. A part-time student is restricted to two courses.



### Courses

**504 - Physics 611. Advanced Quantum Mechanics**

Review of the formal structure of quantum theory from an advanced point of view, matrix methods and transformation theory, angular momentum and spin; systems of particles, perturbation and collision theory, interaction of radiation and matter, introduction to relativistic quantum mechanics, second quantization and elementary quantum electrodynamics. (Full course.)

**Two of the following chosen with the approval of the chairman of the department and the research director:**

**504 - Physics 621. Theoretical Nuclear Physics**

Fundamental facts and theories of the structure of nuclei and their interactions; masses, moments and radii of stable and unstable nuclei, alpha, beta and gamma decay; nuclear models, accelerators and particle physics, nuclear scattering; the many-body problem, Mossbauer effect and resonance fluorescence. (Full course.)

**504 - Physics 631. Theoretical Solid State Physics**

Advanced treatment of selected topics of current interest in solid state physics. Topics include application of quantum mechanics to solids, band theory of metals and semi-conductors, transport properties, imperfections, magnetic properties, low temperature properties, superconductivity. (Full course.)

**504 - Physics 661. Department Seminar, Selected Topics in Current Research.**

**504 - Physics 691. Selected Experiments in Physics**

**504 - Research and Thesis**

Required for all candidates. Students will work on a research project under the direction of a staff member of the department, and present an acceptable thesis at the conclusion. The research done will be in areas which reflect the interest of the staff and the facilities of the department. Fields of research are:

Distribution of alpha particles on the nuclear surface.
Nuclear shape and the effects of nuclear distortion.
Angular distributions from oriented nuclei.
Many-body problems in solid state physics.
Electron interactions in solids in a uniform magnetic field.
Bloch electrons in a magnetic field.

## MASTER OF SCIENCE IN CHEMISTRY

### Admission

Students who have an Honours degree in Chemistry or its equivalent will be admitted to graduate study. Students whose grades are satisfactory but who do not have the equivalent of an Honours degree may also be admitted to the graduate programme.

## General Requirements

1. Students will be required to complete undergraduate courses to make up deficiencies. If too many undergraduate courses are required to remove deficiencies the student will be required to complete these courses before entering the graduate programme. Students who have deficiencies to remove should expect to spend more than the minimum time in residence.
2. On entering the department for graduate work the student will be assigned an advisory committee consisting of his research director and two other staff members of the department. The research director will be chairman of the committee.
3. The student must demonstrate reading ability in a language other than English. This language will be chosen by the advisory committee.
4. Attendance at and participation in departmental seminars will be required of all students.

## Courses

1. **Chemistry 650. Research and Thesis**
2. Advanced Topics course in the general field of the research problem.
3. Advanced Topics course chosen by the advisory committee.

The content of the following courses will vary from year to year and will reflect the interests of the department and the instructor in the course:

**503 - Chemistry 610. Advanced Topics in Analytical Chemistry.**
**503 - Chemistry 615. Advanced Topics in Inorganic Chemistry.**
**503 - Chemistry 620. Advanced Topics in Organic Chemistry.**
**503 - Chemistry 630. Advanced Topics in Physical Chemistry.**
**503 - Chemistry 690. Advanced Topics in Instrumentation.**

**503 - Chemistry 650. Research and Thesis**

This course is required of all students. Students will work on a research project under the direction of a staff member and present an acceptable thesis at the conclusion. The research done will be in areas of interest to the staff. At present the fields of research include:

1. New methods of synthesis of 1-4 thiazine rings.
2. Modification of the structures of carbohydrates for gas chromatography.
3. The examination of non-equivalent protons of methylene groups by N.M.R.
4. Thermal stability and degradation of amide complexes.
5. Structure and kinetics in the pyrolysis of amides.
6. Generation and properties of the dimethylamino free radical.
7. Study of the structure of Ziegler complexes by electron paramagnetic resonance.
8. Study of gamma-induced polymerization in the presence of transition metal salts.



9. Preparation and properties of o-nitrophenol chelates.
10. Properties of inorganic salts in non-aqueous solvents.
11. Compounds of metals in unusual oxidation states.
12. Studies on modular electro-chemical apparatus.
13. Investigation of chemical systems by means of microwave techniques.
14. The Chemistry of selenium and tellurium compounds.
15. Organo-phosphorous and organo-sulphur compounds.

# MASTER IN THE TEACHING OF MATHEMATICS

## Admission

Candidates for admission to the programme must have an undergraduate degree, a teacher's certificate, and at least one year's experience in the teaching of secondary school mathematics, as well as an adequate mathematical background up to and including:

i) A full course in Statistics-Probability.
ii) A full course in Intermediate Analysis.
iii) A full course in Algebra involving a study of fundamental algebraic systems.

## General Requirements

1. Candidates with an inadequate background will be required to take the necessary undergraduate courses.
2. A part-time student may not take more than two full courses per session.

## Degree Requirements

1. **Mathematics 650**
2. Four other full courses approved by the department.
3. One paper on an approved mathematical topic related to one of the courses.

### Courses Offered

**502 - Mathematics 610. Algebra**

Sets and mappings; groups, rings and fields; number systems; polynomials; vector spaces and algebras. (Full course.)

**502 - Mathematics 620. Geometry**

Euclid's axioms; Hilbert's axioms for Euclidean Geometry; Euclid's 5th postulate and the work of Saccheri, Lambert, and Legendre; Consistency of non-Euclidean Lobachevskian Geometry; Projective Geometry; Introduction to Topology. (Full course.)

**502 - Mathematics 630. Analysis**

The real number system; Functions of the real variable; limits, continuity, differentiability; Theories of integration; Analytic functions; Cauchy-Riemann conditions, power series representation, conformal mapping; Integral theorems; Analytic continuation. (Full course.)

**502 - Mathematics 640. Logic and Sets**

Basic relations and operations in sets; Boolean algebra; Symbolic logic; Propositional Calculus Theorem; the logical equivalence of Boolean Algebra and Propositional Calculus; Switching circuits; Quantifiers. (Half course.)

### 502 - Mathematics 645. Numerical Analysis

Roots of an equation; Interpolation; Numerical differentiation and integration; Solution of systems of linear equations; Inversion of matrices; Finite differences; Digital computers, Fortran. (Half course.)

### 502 - Mathematics 650. Elementary Mathematics from an Advanced Point of View

Prerequisites: four full graduate mathematics courses. Historical development of selected mathematical ideas; interaction between mathematics and the natural and social sciences; Theory of problem solving; Workshop on the presentation of elementary mathematical concepts. (Full course.)

### 502 - Mathematics 660. Seminar in Algebra

### 502 - Mathematics 670. Seminar in Analysis

## FACULTY OF SCIENCE

Samuel Madras, *Dean.*

NOTE:—Courses which are no longer offered and those whose titles and course numbers have been changed are listed on Page 264.

### NATURAL SCIENCE

Gordon Cadenhead, *Assistant Professor of Natural Science.*
Edward Russell Paterson, *Assistant Professor of Natural Science.*

### 500 - Natural Science 210. General Course in the Natural Sciences

This course provides a broad, unified and non-technical approach to the natural sciences. Science is presented as a philosophical approach to knowledge, and its relations to the arts, humanities, and society are discussed. A survey of fundamental concepts and principles rather than a detailed description of the separate sciences is emphasized. The subject matter includes, (a) our place in the universe, (b) present understanding of matter and forces, (c) the evolution of the earth and biological life, (d) the evolution of man and society, (e) the broad applied areas of science today, e.g. resources, communications, space, defence, habitation, etc. (Full course.)

### 500 - Natural Science 231. Descriptive Astronomy

The course deals in a descriptive way with the various celestial bodies and their relationships. Starting with the solar system and continuing into stellar and galactic astronomy, it offers the student the modern concept of the stellar universe as a whole. While it avoids mathematical treatment as much as possible, a background of some high school physics and mathematics is of advantage. Lectures are copiously illustrated with slides. The course is intended as a preparation for an intelligent amateur interest in this rapidly expanding science. (Full course.)

### 500 - Natural Science 241. History of Science

This course deals with the origins of science and its development from primitive times to the 19th century. It explains the greatly differing attitudes of the past towards science by relating them to the characteristics of successive historical periods. Throughout the course science is treated as a unity, not subdivided into compartments. It is intended for students who have some background in one or more scientific fields, with the aim of clarifying their views of the significance of their particular interests in the broader conception of science as a whole. (Half course.)



### BIOLOGY

C. F. MacLeod, *Associate Professor of Biology and Chairman of the Department.*
Donald L. Peets, *Professor of Human Genetics.*
F. S. Abbott, *Assistant Professor of Biology.*
S. S. Ashtakala, *Assistant Professor of Biology.*
R. K. Ibrahim, *Assistant Professor of Biology.*
Gerard Leduc, *Assistant Professor of Biology.*
Ruth L. Lowther, *Assistant Professor of Biology.*
Perry D. Anderson, *Lecturer in Biology.*
P. K. Menon, *Visiting Professor of Biology.*

### BIOLOGY

### 501 - Biology 241. Genetics and Human Welfare

Prerequisite: 3rd-year standing. A course on the principles of heredity as understood by modern biology. It deals also with the application of genetic principles to organisms including man. The biological basis of social problems is dealt with at some length. The doctrine of organic evolution and its implications for human life and welfare are considered. Lectures only. (Full course.)

### 501 - Biology 271. Histological Technique

Prerequisite: permission of the instructor. A course in methods of preparing plant and animal tissues for microscopic study. Practical experience is acquired in fixing, embedding, cutting and staining. Lectures and laboratory. (Full course.)

### 501 - Biology 442. Genetics

Prerequisites: Botany 211, Zoology 222, 3rd or 4th-year standing. A course to illustrate the fundamental principles of inheritance in plants and animals. Lectures and laboratory. (Full course.)

NOTE:—No credit will be given for Biology 241 if taken concurrently with or following Biology 442.

### 501 - Biology 443. Cytology

Prerequisites: Botany 211, Zoology 222. Biology 442, Chemistry 221. An introduction to cell structure of both plants and animals, with special reference to genetics. Lectures and laboratory. (Half course.)

### 501 - Biology 452. Limnology

Prerequisites: Zoology 421 or Botany 415 and 4th-year standing. Physical, chemical, and biological factors of lakes and streams in relation to productivity. Lectures and laboratory. (Full course.)

### 501 - Biology 481. History of Biology

Prerequisite: Botany 211, Zoology 222 and any other two courses from the Biology department. A course following the growth of biological science to the end of the nineteenth century. Lectures only. (Full course.)

### 501 - Biology 491. Special Study

Prerequisite: permission must be obtained from the chairman of the department. In this course the student undertakes a special project to develop his knowledge of scientific procedures as used by biologists. (Full course.)

## BOTANY

### 507 - Botany 211. The Plant Kingdom

A course on the nature and evolution of the plant world. The structure, physiology and reproductive processes of representative plants from the simplest to the most complex types are studied. The laboratory work is intended to acquaint the student with the variety of plant organisms and to illustrate botanical techniques. Lectures and laboratory. (Half course.)

### 507 - Botany 411. Systematics of the Vascular Plants

Prerequisite: Botany 211 or Biology 212. A survey of the classification, morphology, distribution and evolution of the flowering and cone-bearing plants and of the ferns. Local species as well as those of wider distribution are studied. Field work includes the preparation of a collection of plants by each student. Lectures and laboratory. (Full course.)

### 507 - Botany 412. Plant Anatomy

Prerequisite: Botany 211 or Biology 212. The internal anatomy and the phylogenetic development of structure in the vascular plants. Lectures and laboratory. (Full course.)

### 507 - Botany 413. Plant Physiology

Prerequisites: Botany 211, Physics 211; Chemistry 221 or 421 previously or concurrently. A study of the physiological activities of plants. Lectures and laboratory. (Full course.)

### 507 - Botany 414. Mycology

Prerequisite: Botany 211. A general course on the structure, classification and functional activities of the fungi. Lectures and laboratory. (Full course.

### 507 - Botany 415. Systematics of Non-Vascular Green Plants

Prerequisite: Botany 211. A survey of the classification, morphology, distribution and evolution of the non-vascular green plants. Lectures and laboratory. (Full course.)

### 507 - Botany 416. Plant Ecology

Prerequisite: Botany 411 previously or concurrently. A study of the interrelal tions between plants and their environment. Lectures and field trips. (Fulcourse.)

### 507 - Botany 417. Plant Morphogenesis

Prerequisites: Botany 412, 413, Chemistry 221. Growth and differentiation of cells, tissues and organs in plants. Lectures and laboratory. (Full course.)

## ZOOLOGY

### 508 - Zoology 222. The Animal Kingdom

A course in general zoology. The structure, physiology, reproduction and evolution of representative species are considered. Lectures and laboratory. (Half course.)

### 508 - Zoology 421. Invertebrate Zoology

Prerequisite: Biology 221 or Zoology 222. A course on the structure, taxonomy and development of the invertebrate animals. Emphasis is placed on species of economic importance. Biological phenomena such as regeneration and the parasitic mode of life are considered. In the laboratory representatives of the principal invertebrate phyla are dissected. Field work includes the preparation of a collection of animals by each student. Lectures and laboratory. (Full course.)



### 508 - Zoology 422. Chordate Anatomy

Prerequisite: Zoology 222. The comparative anatomy of chordate animals, their reproduction, development, distribution and evolution. In the laboratory, representatives of the principal vertebrate classes are dissected. Lectures and laboratory. (Full course.)

### 508 - Zoology 423. Advanced Vertebrate Zoology

Prerequisite: Zoology 422. A course involving a study of selected groups of vertebrate animals. Lectures and laboratory. (Full course.)

### 508 - Zoology 424. Parasitology

Prerequisite: Zoology 222. A survey of the parasitic groups of invertebrates with special reference to the parasites of man. Lectures and laboratory (Half course.)

### 508 - Zoology 425. Entomology

Prerequisite: Biology 221 or Zoology 222. An introduction to the study of insects, their morphology, taxonomy, physiology, and ecology. Lectures and laboratory, (Half course.)

### 508 - Zoology 431. Animal Physiology

Prerequisites: Zoology 222, Chemistry 221 or 421, Physics 211. A study of the physiological processes of animals at the cellular and system levels. Lectures and laboratory. (Full course.)

### 508 - Zoology 432. Advanced Animal Physiology

Prerequisites: Zoology 421, 422, 431 and Biology 451 previously or concurrently. Lectures and seminars dealing with selected topics in environmental and comparative physiology. Laboratory studies will include vertebrate and invertebrate representatives. (Full course.)

### 508 - Zoology 451. Animal Ecology

Prerequisites: Botany 211 or Biology 212, Zoology 222. The natural history of animals. A study of the interrelations between animals, groups of animals, and their environments. Zoological geography; migrations and other movements of animals. Ecology and evolution. Lectures only. (Full course.)

### 508 - Zoology 461. Vertebrate Embryology

Prerequisite: Zoology 422. The fundamental processes of growth and development in the vertebrates. A comparative study is made of selected vertebrate species. Lectures and laboratory. (Full course.)

### 508 - Zoology 471. Vertebrate Histology

Prerequisite: Zoology 422. A study of the microscopic characteristics of tissues and organs of vertebrates. Lectures and laboratory. (Half course.)

### Cognate Courses

Courses in related fields may be helpful or required for the student who plans a career in a branch of Biology. Among such courses are Chemistry 221 or 421, 441, 442, 443, German 215, and Mathematics 451.

## CHEMISTRY

John Russell Ufford, *Professor of Chemistry and Chairman of the Department.*
Samuel Madras, *Professor of Chemistry.*
Roger H. C. Verschingel, *Associate Professor of Chemistry.*
Thomas J. Adley, *Assistant Professor of Chemistry.*
James G. Dick, *Assistant Professor of Chemistry and Materials Science.*
Zacharias Hamlet, *Assistant Professor of Chemistry.*
Jacques Lenoir, *Assistant Professor of Chemistry.*
Andrew D. Long, *Assistant Professor of Chemistry.*
Robin T. B. Rye, *Assistant Professor of Chemistry.*
Rodrick E. Townshend, *Assistant Professor of Chemistry.*
Ronald Westbury, *Assistant Professor of Chemistry.*

### 503 - Chemistry 211. General Chemistry

Prerequisite to all other chemistry courses. Fundamental development of the theory of chemistry. Lectures, conferences and laboratory. (Full course.)
Textbook: Chemical Systems, C.B.A., (*McGraw-Hill*).

### 503 - Chemistry 221. Elements of Organic Chemistry

Prerequisite: Chemistry 211. Chemistry of aliphatic, aromatic and heterocyclic compounds. The application of organic chemistry to other fields such as biochemistry, biology and pharmacology. Lectures and laboratory (Full course.)
NOTE:—Credit will not be given for both Chemistry 221 and Chemistry 421. Chemistry 421 is prerequisite for certain advanced courses.
Textbook: Cram and Hammond, *Organic Chemistry*, (*McGraw-Hill*).

### 503 - Chemistry 231. Introductory Physical Chemistry

Prerequisites: Chemistry 211, Mathematics 213 or 221, Physics 211. Gas state, liquids and solutions, introduction to the solid state, introduction to thermodynamics, thermochemistry, electrochemistry and introduction to chemical kinetics. Lectures only. (Full course.)
Textbook: Hamill, Williams and MacKay, *Principles of Physical Chemistry*, (*Prentice-Hall*).

### 503 - Chemistry 411. Introductory Inorganic Chemistry

Prerequisites: Chemistry 211, Mathematics 213 or 221; Chemistry 412 previously or concurrently. Solubility, crystal structure, amphoterism, electronegativity, atomic and molecular structure, complexion formation and structure, oxidation-reduction and apparent anomalies in the periodic table. The laboratory consists of a systematic study of the elements of the periodic table to illustrate the principles discussed in the lectures. Lectures and laboratory. (Half course.)
Textbooks: Butler, *Solubility and pH Calculations*, (*Addision-Wesley*).
Larsen, *Transitional Elements*, (*Benjamin*).
Jolly, *Chemistry of the Non-Metals*, (*Prentice-Hall*).

### 503 - Chemistry 412. Introductory Quantitative Analysis

Prerequisites: Chemistry 211, Mathematics 213 or 221; Chemistry 411 previously or concurrently. Fundamental principles of quantitative analysis applied to neutralization, precipitation, oxidation-reduction and complex formation reactions. Lectures and laboratory. (Half course.)
Textbook: Fitz and Schenk, *Quantitative Analytical Chemistry*, (*Allyn and Bacon*).

### 503 - Chemistry 415. Intermediate Inorganic Chemistry

Prerequisites: Chemistry 411, 412; Chemistry 432 previously or concurrently. Amplification of periodic classification, oxidation-reduction, electronegativity. and crystal chemistry. Discussion of non-aqueous, non-stoichiometric and radiochemistry. Lectures and laboratory. (Full course.)
Textbook: Day and Selbin, *Theoretical Inorganic Chemistry*, (*Reinhold*).



### 503 - Chemistry 416. Advanced Inorganic Chemistry

Prerequisites: Chemistry 415; Mathematics 452. Introduction to quantum theory. Structure of atoms, molecules, metals, organo-metallic and coordination compounds. Lectures only. (Full course.)
Textbook: Day and Selbin, *Theoretical Inorganic Chemistry*, (*Reinhold*).

### 503 - Chemistry 417. Advanced Quantitative Analysis

Prerequisites: Chemistry 411, 412; Physics 211; Chemistry 490 previously or concurrently. Instrumental methods in neutralization, precipitation, oxidation-reduction, colorimetry, spectrophotometry, conductimetry, coulometry and electrogravimetry. Lectures and laboratory. (Half course.)
NOTE:—Students who have credit for Chemistry 413 may not take this course for credit.
Textbook: Delahay, *Instrumental Analysis*, (*MacMillan*).
Laboratory Manual: Meloan and Kiser, *Problems and Experiments in Instrumental Analysis*.

### 503 - Chemistry 421. Introductory Organic Chemistry

Prerequisite: Chemistry 211. Chemistry of aliphatic and aromatic compounds; structural isomerism and stereoisomerism; mechanisms, electronic theories and stereochemistry of organic reactions. Lectures and laboratory. (Full course.)
NOTE:—Students who have credit for Chemistry 221 may not take this course for credit.
Textbook: Morrison and Boyd, *Organic Chemistry*, (*Allyn and Bacon*).

### 503 - Chemistry 422. Carbohydrates, Amino Acids and Polypeptides

Prerequisite: Chemistry 221, or equivalent. Topics studied are: structures, stereochemistry and reactions of carbohydrates; syntheses, stereochemistry and physiochemical properties of amino acids; determination of amino acid sequences; synthetic methods and conformations of polypeptides and proteins. Lectures only. (Half course.)
NOTE:—Chemistry 422 may not be taken after Chemistry 441. Only one credit will be given for the combination Chemistry 422 followed by Chemistry 441.
Textbooks: Guthrie and Honeyman, *An Introduction to the Chemistry of Carbohydrates, 2nd ed.*, (*Oxford*).
Kopple, *Peptides and Amino Acids*, (*Benjamin*).

### 503 - Chemistry 423. Advanced Organic Chemistry

Prerequisites: Chemistry 424 or 427, 432. Advanced topics in organic chemistry. Lectures only. (Half course.)
Textbook: Gould, *Mechanism and Structure in Organic Chemistry*, (*Holt*).

### 503 - Chemistry 425. Chemistry of High Polymers

Prerequisites: Chemistry 221 or equivalent, Chemistry 231. Survey of natural and synthetic polymers. Correlation of structure and properties of macromolecules. Methods and mechanisms of polymerizarion. Lectures only. (Half course.)
Textbook: Stille, *Introduction to Polymer Chemistry*, (*Wiley*).

### 503 - Chemistry 426. Advanced Organic Chemistry II

Prerequisite: Chemistry 424 or 427. Chemistry of heterocyclic compounds. Application of advanced techniques to synthetic organic chemistry. Lectures and laboratory. (Half course.)
Textbook: Acheson, *An Introduction to the Chemistry of Heterocyclic Compounds*, (*Wiley*).

### 503 - Chemistry 427. Intermediate Organic Chemistry

Prerequisites: Chemistry 412, 421. Amplification of concepts presented in introductory organic chemistry; qualitative and quantitative analysis of organic compounds and mixtures. Lectures and laboratory. (Half course.)

NOTE:—Students who have credit for Chemistry 424 may not take this course for credit.

Textbooks: House, *Modern Synthetic Reactions*, (*Benjamin*).
Breslow, *Organic Reaction Mechanisms*, (*Benjamin*).
Saunders, *Ionic Aliphatic Reactions*, (*Prentice-Hall*).
Cheronis and Entriken, *Semimicro Qualitative Organic Analysis*, (*Interscience*).

### 503 - Chemistry 432. Intermediate Physical Chemistry.

Prerequisites: Chemistry 432 previously or concurrently, Mathematics 451. The three laws of thermodynamics and their applications to chemistry and electrochemistry; heat, work and internal energy; entropy, free energy, chemical potential, fugacity, activity and activity coefficients; introduction to statistical thermodynamics. Lectures and laboratory. (Full course.)

Textbook: Klotz, *Chemical Thermodynamics*, (*Benjamin*).
Salzberg, et al., *Laboratory Course in Physical Chemistry*, (*Academic*).

### 503 - Chemistry 433. Advanced Physical Chemistry

Prerequisites: Chemistry 432; Mathematics 452 previously or concurrently. Statistical thermodynamics and chemical kinetics. Lectures and laboratory. (Full course.)

Textbooks: Laidler, *Chemical Kinetics*, (*McGrow-Hill*).
Salzberg, et al., *Laboratory Course in Physical Chemistry*, (*Academic*).
Andrews, *Equilibrium Statistical Mechanics*, (*Wiley*).

### 503 - Chemistry 441. Introductory Biochemistry

Prerequisites: Chemistry 221 or equivalent, and any formal course in Biology. Study of carbohydrates, lipids, proteins, enzymes, and nucleic acids. Metabolic pathways with some reference to pathological conditions and detoxication mechanisms. Lectures and laboratory. (Full course.)

NOTE:—Chemistry 422 may not be taken after Chemistry 441. Only one credit will be given for the combination Chemistry 422 followed by Chemistry 441.

Textbook: White et al., *Principles of Biochemistry*, (*McGraw-Hill*).
References: West and Todd, *Textbook of Biochemistry*, (*MacMillan*).
Karlson, *Textbook of Biochemistry*, (*Academic Press*).

### 503 - Chemistry 442. Advanced Biochemistry

Prerequisites: Chemistry 441; Zoology 431 previously or concurrently. Metabolism of amino acids. Role of steroids and their biosynthesis. Metabolism of pigments of the porphyrin type in relation to their origin and role in animal respiration and in carbon dioxide fixation. Photosynthetic cycle. Biosynthesis and function of antibiotics. Mechanism of antibiotic action on microorganisms. Lectures and laboratory. (Full course.)

Textbook: Fruton and Simmonds, *General Biochemistry*, (*Wiley*).
Reference: Greenberg, *Metabolic Pathways*, (*Academic*).

### 503 - Chemistry 443. Advanced Biochemistry II

Prerequisites: Chemistry 231, 441; Chemistry 442 previously or concurrently. Selected topics in Biochemistry. In the laboratory the student will work on a research project under the direction of a staff member and write a report on the results. Lectures and laboratory. (Full course.)

Textbook: Greenberg, *Metabolic Pathways*, (*Academic*).



### 503 - Chemistry 450. Research Project and Thesis

Prerequisite: permission of the Chemistry department. The student will work on a research project under the direction of a staff member and write a thesis on the result. (Full course.)

NOTE:—This course is required of fourth-year honours students. Some fourth-year major students may take it with special permission. Students planning to take this course should consult with the Chemistry department as early in their third year as possible.

### 503 - Chemistry 461. Industrial Inorganic Chemistry

Prerequisite: Chemistry 211. Study of industrial inorganic processes. The industries discussed include those concerned with mineral acids, alkalies, synthetic ammonia, fertilizers, cements, ceramics, glass, electrothermal products, electrometallurgy, water treatment, etc. This course is not applicable towards a major in Chemistry. Lectures only. (Half course.)

### 503 - Chemistry 462. Industrial Organic Chemistry

Prerequisite: Chemistry 221 or equivalent. This course is similar to Chemistry 461, but deals with the field of organic chemistry. The industries discussed include those concerned with organic synthesis, fermentation, coal and wood distillation, petroleum refining, oils and fats, pulp and paper, paints, resins and plastics, rubber, etc. This course is not applicable towards a major in Chemistry. Lectures only. (Half course.)

### 503 - Chemistry 490. Introductory Chemical Instrumentation

Prerequisites: Chemistry 231, 412; Mathematics 451. Transducers and related principles of electricity, electronics and optics in chemical instrumentation. The laboratory consists of a systematic study of instrumentation units. Lectures and laboratory. (Full course.)

Textbooks: Malmstadt, et al., *Electronics for Scientists*, (*Benjamin*).
Phillips, *Electronics for Experimenters*, (*Wiley*).

### 503 - Chemistry 491. Advanced Chemical Instrumentation

Prerequisites: Chemistry 413 or 417, 424 or 427, 432 and 490. Theory and application of emission spectroscopy, absorption spectrophotometry, X-ray spectrometry, nuclear magnetic resonance, mass spectrometry, radiochemistry, electrochemistry, gas chromatography, etc. Lectures and laboratory. (Full course.)

Textbook: Banwell, *Molecular Spectroscopy*, (*McGraw-Hill*).

Laboratory Manual: Meloan and Kiser, *Problems and Experiments in Instrumental Analysis*.

## GEOLOGY

André N. Deland, *Assistant Professor of Geology, and Chairman of the Department.*

### 506 - Geology 211. Physical Geology.

An introductory course to the study of the earth. Principles and methods of physical geology are emphasized with occasional discussion on the historical aspects of geology. The earth's materials including minerals, rocks, soils, fossils, surface water and ground water and their formation are examined. The surface processes both constructive and destructive and the resulting landforms are studied. The earth's forces and movements; the structures of its crust and interior. During the laboratory periods, the student will study the various materials of the earth. With geological, topographic, geophysical maps and aerial photographs, he will interpret landforms and structures. Lectures and laboratory. (Full course.)

### 506 - Geology 212. Earth History and Stratigraphy.

The earth's past history both physical and biological as revealed in strata and by fossils. Introduction to the methods and principles of historical geology, stratigraphy and sedimentation. Study of paleogeographic maps. Systematic examination from the oldest known rocks to the youngest ones and from the oldest known fossils to the most recent ones including the history of man. Studies of the various rock, time-rock and time units. Stratigraphic correlation by means of lithology and paleontology. Typical stratigraphic sections will be examined. Lectures only. (Full course.)

### 506 - Geology 221. Mineralogy* (not offered in 1967-68)

### 506 - Geology 222. Optical Mineralogy* (not offered in 1967-68)

### 506 - Geology 223. Paleontology* (not offered in 1967-68)

Prerequisite: Geology 211 previously or concurrently. The principles and methods of paleontology. Nature of fossils and the succession of life on earth. The study of ancient forms of life as seen in fossils, plants, invertebrates and vertebrates. The history, development and imperfection of this fossil record. Study of the various phyla and classes. The meaning and methods of evolution. Evolution as seen in fossils. Techniques for the collecting of fossils and preparation of illustrations. Examples of fossil occurrences and how they are used. Lectures and laboratory. (Half course.)

### 506 - Geology 231. Petrology* (not offered in 1967-68)

### 506 - Geology 241. Structural Geology* (not offered in 1967-68)

**For course descriptions see 1966-67 Announcement.*



## MATHEMATICS

Norman Edward Smith, *Professor of Mathematics, and Chairman of the Department.*
Frederick W. Bedford, *Associate Professor of Mathematics.*
Martin Harrow, *Associate Professor of Mathematics.*
Edna Vowles, *Associate Professor of Mathematics.*
Kailash K. Anand, *Assistant Professor of Mathematics.*
Mary A. Brian, *Assistant Professor of Mathematics.*
Victor Byers, *Assistant Professor of Mathematics.*
James C. Hayes, *Assistant Professor of Mathematics.*
G. S. Lingappaiah, *Assistant Professor of Mathematics.*
Eugen A. Pollitzer, *Assistant Professor of Mathematics.*
John Senez, *Assistant Professor of Mathematics.*
Manfred E. Szabo, *Assistant Professor of Mathematics.*
Jean C. Turgeon, *Assistant Professor of Mathematics.*
T. Dwivedi, *Lecturer in Mathematics.*
M. Malik, *Lecturer in Mathematics.*
S. Bekker, *Sessional Lecturer in Mathematics.*
M. Alberta Boswall, *Sessional Lecturer in Mathematics.*
Jean C. Chalk, *Sessional Lecturer in Mathematics.*
A. M. Chrysovergis, *Sessional Lecturer in Mathematics.*
Alma N. Dobson, *Sessional Lecturer in Mathematics.*
N. Herscovics, *Sessional Lecturer in Mathematics.*

### FIRST YEAR MATHEMATICS REQUIREMENTS

#### Science

(1) A student who has passed the High School Leaving examinations in Elementary Algebra and Geometry, must take Mathematics 213 and 223.

(2) A student who has passed the High School Leaving examinations in Elementary Algebra and Geometry, and who has, in addition, obtained grades of 65% or better in the High School Leaving examinations in Intermediate Algebra and Trigonometry must take both Mathematics 233 and 451, or both Mathematics 213 and 223.

(3) A student who has passed the High School Leaving examinations in Elementary Algebra and Geometry and who has passed the Senior Matriculation examinations in Intermediate Algebra and Trigonometry will receive one credit in Mathematics, and must take Mathematics 233.

(4) A student who has passed the High School Leaving examinations in Elementary Algebra, Geometry, Intermediate Algebra and Trigonometry and the Senior Matriculation examinations in Analytic Geometry and Calculus will receive one credit in Mathematics, and must take Mathematics 450.

(5) A student not fitting any of these categories should consult the Mathematics Department.

#### Engineering

(1) A student who has passed the High School Leaving examinations in Elementary Algebra and Geometry must take Mathematics 213 and 223.

(2) A student who has passed the High School Leaving examinations in Elementary Algebra and Geometry, and who has, in addition, obtained grades of 65% or better in the High School Leaving examinations in Intermediate Algebra and Trigonometry must take Mathematics 233, or both Mathematics 213 and 223.

#### Commerce

(1) Students must take Mathematics 251 or 450 or 451.

NOTE:—Many of the elementary Mathematics courses contain duplications. Following is a list of these courses accompanied by two letters. No student may take two courses which have letters in common.

Mathematics 213 P, Q.
Mathematics 223 R, S.
Mathematics 233 Q, S.
Mathematics 251 P, T.
Mathematics 450 Q, U.
Mathematics 451 T, U.

### 502 - Mathematics 201. Elements of Mathematics

This course is offered for students who have not had the usual pre-university training in mathematics. Subject matter: Elementary algebra up to and including simultaneous quadratic equations, and indices; certain theorems and problems in plane geometry. Students may have the option of taking an extra tutorial period, and may be required to do so at the instructor's discretion. (Full course.)

NOTE:—Students who have received credit toward their admission for high school Mathematics may not take this course for credit.

This course will not satisfy the requirements in Mathematics for any degree or diploma. It may be counted as an option in the Faculty of Science by students eligible to receive credit for it.

### 502 - Mathematics 213. Algebra

Sets; function; natural, integral, rational, real and complex numbers; logarithms; inequalities; permutations and combinations; mathematical induction; theory of equations; determinants. (Full course.) See Note on course duplications.

### 502 - Mathematics 223. Analytical Trigonometry and Geometry

Prerequisite: Mathematics 213 previously or concurrently. Coordinate systems; distance formula; angular measures; trigonometry—function, right triangle, identities, composite angles, oblique triangle, inverse functions, equations; complex numbers in polar form; geometry—translation, rotation, straight line, circle, parabola, ellipse, hyperbola, parametric equations. (Full course.) See Note on course duplications.

### 502 - Mathematics 233. Algebra and Analytic Geometry

Prerequisite: 65% in high school Trigonometry and Intermediate Algebra. Day Science students registering for this course must also register for a special section of Mathematics 451 concurrently. Algebra—sets, functions, number systems, inequalities, mathematical induction, theory of equations, determinants; Geometry—coordinate systems, distance formula, translation, rotation, straight line, circle, parabola, ellipse, hyperbola, parametric equations. (Full course.) See Note on course duplications.

### 502 - Mathematics 251. Fundamental Mathematics

This course is intended primarily for Commerce students and includes selected topics from Algebra and Calculus as follows: sets; relations and functions and their graphs; straight line and circle; exponential and logarithmic functions; progressions, elementary theory of equations; inequalities; permutations, combinations and binomial theorem; limits and continuity; differentiation of rational, exponential, and logarithmic functions with applications; integration with applications. Lectures and practice period. (Full course.) See Note on course duplications.



### 502 - Mathematics 411. Algebraic Systems

Prerequisites: Mathematics 451 or 450 previously or concurrently; Mathematics 431 previously or concurrently. Two by two and three by three matrices; rings and fields; integers; rational, real, and complex number fields; elementary group theory; vector spaces over a field; dimension; matrices and linear transformations. (Full course.)

NOTE:—Students having a previous or concurrent credit in Mathematics 459 may not take this course for credit.

### 502 - Mathematics 431. Analytic Geometry and Series

Prerequisites: Mathematics 450 previously or concurrently, or Mathematics 451 previously or concurrently. Continuation of plane geometry; co-ordinate systems in space, line, plane and other surfaces; vectors, inner and outer products, linear dependence and bases, directional derivative; sequences and series, tests for convergence, power series. (Full course.)

### 502 - Mathematics 440. Introductory Mathematical and Applied Statistics

Prerequisites: Mathematics 451 or 450. This course emphasizes the various applications of statistics and probability with sufficient mathematical theory to give unification and continuity. Probability, distributions, moments and sampling theory are introduced; problems in estimation, hypothesis testing, correlation and regression, elementary experimental design and analysis are considered with applications to various disciplines. (Full course.)

Note:—This course is designed for students who do not intend to specialize in Statistics.

Only one full credit will be given from among Mathematics 440, Statistics 242, Sociology 241, Economics 481, Social Science 241, Psychology 241.

### 502 - Mathematics 441. Mathematical Statistics

Prerequisites: Mathematics 450 or 451; Mathematics 431 previously or concurrently. The introductory mathematical theory of statistics, including discrete and continuous probability theory, Bayes theorem and related topics, probability distributions and densities, expectation and moment generating functions, sums of random variables, law of large numbers and Central Limit Theorem, sampling distributions, point and interval estimation, parametric and non-parametric hypothesis testing. (Full course.)

NOTE:—This course is designed for students who intend to specialize in Statistics.

Only one credit will be given for a combination of Mathematics 441 with any of Mathematics 440, Mathematics 241, Statistics 242, Sociology 241, Economics 481, Social Science 241, Psychology 241.

### 502 - Mathematics 442. Experimental and Survey Statistics

Prerequisites: Mathematics 441; Computer Science 471 previously or concurrently during the first term. Principles of design, various experimental designs. Analysis of variance, regression, additional and subsidiary techniques. Non-parametric designs. Introduction to response surface exploration. Planning of surveys, theory of survey sampling. Programming and computer solution of selected problems (Full course.)

### 502 - Mathematics 444. Methods of Operations Research

Prerequisites: Mathematics 452; Mathematics 441 or 440 previously or concurrently. Formulation of mathematical models in the deterministic and probabilistic cases, methods of solution, testing the models. Applications to inventory, queuing, allocation (linear and dynamic programming, duality), competition (game theory), scheduling, networks and flow. Emphasis on mathematical methods, including Laplace and a transforms, matrix algebra, search techniques, simulation. (Full course.)

### 502 - Mathematics 446. Industrial Statistics

Prerequisites: Mathematics 441; Computer Science 471 previously or concurrently during first term. Methods of control, primarily by various types of charts. Assignable causes. Acceptance sampling in batch and continuous cases, by various methods. Statistical aspects of tolerances and process capability. Narrow limit gauging. Problems of poor data. Operating characteristic curves of all plans considered. Applications of regression and correlation, and non-parametric techniques. The statistics of reliability and life testing, series and parallel systems, redundancy. Programming and computer solutions of selected programmes. (Full course.)

### 502 - Mathematics 448. Probability and Stochastic Processes

Prerequisites: Mathematics 441, 452, 459. Sample spaces, combinatorial analysis, theorems and applications of probability, including limit theorems, generating functions, branching processes, random walk and ruin problems. Discrete and continuous stochastic processes of Markov and general types, correlations, spectral and other representations. (Full course.)

### 502 - Mathematics 450. Algebra and Continuation of Elementary Calculus

Prerequisites: Junior Matriculation courses in Intermediate Algebra and Trigonometry, and Senior Matriculation courses in Analytic Geometry and Calculus, or their equivalents. The subject matter of the course consists of parts of Mathematics 213 and Mathematics 451 not previously covered. It is intended primarily for students transferring into the second year. Upon successful completion of this course the student would be in the same situation as one who had credits in Mathematics 233 and Mathematics 451. (Full course.) See Note on course duplications.

### 502 - Mathematics 451. Calculus

Prerequisites: (a) Mathematics 213, 223, (b) Mathematics 233 previously in the Evening Division and concurrently in the Day Division, (c) Mathematics 211, 221, 231. Limits, differentiation and integration of rational and trigonometric functions, applications, mean value theorems, differentials, properties of the definite integral, logarithmic and exponential functions, Taylor's expansion, partial differentiation. (Full course.) See Note on course duplications.

### 502 - Mathematics 452. Differential Equations

Prerequisites: Mathematics 451; 431 previously or concurrently. First order first degree equations, linear equations, operators, Laplace transforms, series solutions and special functions, numerical methods, elementary partial equations Fourier series. (Full course.)

NOTE:—Only one full credit will be given from among Mathematics 452, 455 and 456.



### 502 - Mathematics 457. Advanced Calculus

Prerequisites: Mathematics 431, 451. Indeterminate forms, partial differentiation, multiple integrals, line integrals improper integrals, gamma and beta functions, basic complex integral theorems, residue theory. (Full course.)

NOTE:—This course is intended primarily for Physics students. It does not serve as prerequisite to Mathematics 461 or 462.

Only one full credit will be given from among Mathematics 453, 454, 457, and 458.

### 502 - Mathematics 458. Intermediate Analysis

Prerequisites: Mathematics 431, 451. Indeterminate forms, partial differentiation, multiple integral, line integrals, series, improper integrals, gamma and beta functions, orthogonal functions. (Full course.)

NOTE:—Only one full credit will be given from among Mathematics 453, 454, 457, and 458.

### 502 - Mathematics 459. Linear Algebra

Prerequisites: Mathematics 431, 451. Vector spaces, linear transformations, matrices, determinants, equivalence relations on matrices, characteristic values, metric concepts, matrix functions, convex sets. (Full course.)

### 502 - Mathematics 461. Real Variable

Prerequisites: Mathematics 458, or 453 and 454. Definition of real numbers, set theory, continuity, differentiation, mean value theorems, functions of bounded variation, Riemann-Stieltjes integration, selected topics. (Full course.)

### 502 - Mathematics 462. Complex Variable

Prerequisites: Mathematics 458, or 453 and 454. Elementary functions, Cauchy-Riemann equations, integration, Cauchy's integral theorem, Taylor's and Laurent's theorems, calculus of residues, analytic continuation, conformal mapping. (Full course.)

### 502 - Mathematics 463. Abstract Algebra

Prerequisite: Mathematics 459. Integral domains, rings, fields, groups, selected topics. (Full course.)

### 502 - Mathematics 471. Digital Computer Programming

This course now offered as Computer Science 471. See page 00.

### 502 - Mathematics 481. Set Theory and Logic

Prerequisites: three B-level Mathematics courses. Formal systems of logic and their application to the formulation of mathematical arguments; the Zermelo-Fraenkel theory of sets; ordinal and cardinal numbers. (Half course.)

**502 - Mathematics 291**
**502 - Mathematics 292**
**502 - Mathematics 391**
**502 - Mathematics 392**

See Faculty of Engineering.

## COMPUTER SCIENCE

### 930 - Computer Science 471. Digital Computer Programming and Numerical Methods.

Prerequisite: Mathematics 452 or 455 previously or concurrently. A course in computer programming oriented to senior students in the Sciences. This course will teach the students Fortran programming with applications in numerical analysis and advanced mathematical techniques. Lectures and laboratory. (Half course.)

NOTE:—1. This course was formerly offered as Mathematics 471.
2. Only a half-credit will be given from among Computer Science 211, 471, Mathematics 471, Engineering 214, 371.
3. Additional courses at a more elementary level are available as electives from the Faculty of Engineering. See page 209.

## PHYSICS

Walter R. Raudorf, *Professor of Physics and Chairman of the Department.*
Jean-Pierre Petolas, *Associate Professor of Physics.*
John R. Addison, *Assistant Professor of Physics.*
David E. Charlton, *Assistant Professor of Physics.*
Barry Frank, *Assistant Professor of Physics.*
Sushil K. Misra, *Assistant Professor of Physics.*
Stanley P. Morris, *Assistant Professor of Physics.*
Ramesh C. Sharma, *Assistant Professor of Physics.*
Adolph E. Smith, *Assistant Professor of Physics.*
Francisco Tomas, *Director of Physics Laboratories.*

### 504 - Physics 210. Great Discoveries in Modern Physics

This course is intended primarily for Arts students. It traces the fundamental ideas of modern physics and their historical development by a descriptive and reflective study of the most telling discoveries in modern physics. Lectures only. (Full course.)

NOTE:—Students who have credit for Physics 211 may not take this course for credit.

References: Bennett, *Physics without Mathematics.*
Gamow and Cleveland, *Physics, Foundations and Frontiers.*
Gamow, *The Atom and its Nucleus.*
Semat and White, *Atomic Age Physics.*

### 504 - Physics 211. General Physics (Introductory)

Prerequisites: Mathematics 213 and 223, or 233, or 211 and 221 previously or concurrently. Elements of mechanics, sound, heat, magnetism, electricity, and light. A semi-quantitative approach using only elementary mathematical methods. This course may be taken by students having no previous knowledge of physics. Lectures and laboratory. (Full course.)

References: Smith and Cooper, *Elements of Physics.*
Morgan, *Introduction to University Physics.*

### 504 - Physics 222. Sound and Light

Prerequisites: Physics 211; Mathematics 451 previously or concurrently. Simple harmonic motion, waves, Huygen's principle, interference and diffraction of sound and light, acoustics, lenses and mirrors, illumination, polarization, origin of spectra. Lectures and laboratory. (Half course.)

References: Marshall and Pounder, *Physics.*
Robertson, *Introduction to Physical Optics.*
Jenkins and White, *Principles of Optics.*
Sears, *Optics.*



### 504 - Physics 232. Heat

Prerequisites: Physics 211; Mathematics 451 previously or concurrently. Temperature, thermal properties of matter, gas laws, kinetic theory, the laws of thermodynamics, heat engines, heat transfer. Lectures and laboratory. (Half course.)

References: Marshall and Pounder, *Physics.*
Zemansky, *Heat and Thermodynamics.*
Weber, *Heat and Temperature Measurement.*
Sears, *Mechanics, Wave Motion and Heat.*

### 504 - Physics 440. Mechanics

Prerequisities: Physics 211; Mathematics 451 previously or concurrently. Methods of Plane Kinematics, Statics and Dynamics. Lectures and laboratory. (Half course.)

References: Feynman, *The Feynman Lectures on Physics.*
Kittel, *Mechanics.*

### 504 - Physics 441. Statics and Dynamics

Prerequisites: Physics 211, 440, Mathematics 451. Analytic and vector mechanics of particles and rigid bodies, gyroscopic motion, Lagrange's equations, Hamilton's principle, some non-holonomic systems, Relativity. Lectures only. (Full course.)

References: Becker, *Introduction to Theoretical Mechanics.*
Fowles, *Analytical Mechanics.*
Lamb, *Statics.*

### 504 - Physics 442. Mechanics of Continuous Media

Prerequisites: Physics 211; Mathematics 451 previously or concurrently. General properties of matter; elasticity; stress and strain; compressibility of liquids, solids and gases; fluid statics; surface tension; fluid dynamics; flow of ideal and real fluids. Lectures and laboratory. (Half course.)

References: Prandtl and Tietjens, *Fundamentals of Hydro and Aerodynamics.*
Shames, *Mechanics of Fluids.*

### 504 - Physics 451. Advanced Electricity and Magnetism

Prerequisites: Physics 211, 452, Mathematics 451. This course is intended chiefly for students honouring in Physics. It is a continuation of Physics 452 with emphasis on the application of Maxwell's Equations, circuit concepts, transmission lines, radiation, and wave propagation. Lectures only. (Full course.)

References: Tralli, *Electromagnetic Theory.*
Slater and Frank, *Electromagnetism.*
Corson and Lorrain, *Electromagnetic Fields and Waves.*
Cheston, *Electric and Magnetic Fields.*

### 504 - Physics 452. Electricity and Magnetism

Prerequisites: Physics 211, Mathematics 451. Analysis of direct-current circuits; steady-state magnetism; chemical and thermal effects of a current; electrostatic problems; charged particles in electric and magnetic fields; electromagnetic induction; transient currents; analysis of alternating current circuits; transformers; basic electronics. Lectures and laboratory. (Full course.)

References: Duckworth, *Electricity and Magnetism.*
Page and Adams, *Principles of Electricity, 3rd ed..*
Kipp, *Fundamentals of Electricity and Magnetism.*

### 504 - Physics 453. Electronics

Prerequisite: Physics 452 or equivalent. Electric and magnetic properties of solids, semiconductors, transistors, vacuum tubes, transistor and vacuum tube amplifiers, oscillators, modulation theory, switching circuits, analog computers. (Full course.)

References: Hemenway, Henry, Caulton, *Physical Electronics.*
Brophy, *Basic Electronics for Scientists.*
Simpson, Richards, *Junction Transistors.*

### 504 - Physics 461. Atomic and Nuclear Physics

Prerequisites: Physics 211; Mathematics 451. Special relativity theory, quantum theory. Elementary particles, structure of the atom, X-rays, Compton effect, photo-electric effect, Bohr's theory of atomic spectra, De Broglie waves, Schrodinger's equation, radioactivity, nuclear physics, atomic energy, cosmic rays. Lectures and laboratory. (Full course.)

References: Weidner and Sells, *Elementary Modern Physics.*
Beiser, *Concepts of Modern Physics.*

### 504 - Physics 471. Methods of Theoretical Physics

Prerequisites: Physics 441, 452; Mathematics 452 or 455, and 457 or 453 previously or concurrently. Application of differential equations, Fourier transforms, vector and tensor analysis to problems in physics. Lectures only. (Full course.)

References: W. V. Houston, *Principles of Mathematical Physics.*
A. J. McConnell, *Applications of Tensor Analysis.*
Morse and Feshbach, *Methods of Theoretical Physics.*
L. P. Smith, *Mathematical Methods of Scientists and Engineers.*

### 504 - Physics 472. Introductory Quantum Mechanics

Prerequisite: Physics 461. This course is mainly for students honouring in Physics. Basic postulates, operators and statefunction, Schrodinger's equation, one-dimensional motion, harmonic oscillator, central potential, angular momentum, matrix representation, equations of motion, spin, approximation methods, scattering. (Full course.)

References: Dicke and Wittke, *Introduction to Quantum Mechanics.*
Park, *Quantum Theory.*
Schiff, *Quantum Mechanics.*

### 504 - Physics 481. Biophysics

Prerequisites: Chemistry 231, Physics 211, one course in Biology. Topics treated will include the biophysical view of the cell, energy relations in the cell, action of ionizing radiation, biophysics of muscle and nerve. Lectures and laboratory. (Half course.)

References: Setlow and Pollard, *Molecular Biophysics.*
Oncley, *Biophysical Science.*

### 504 - Physics 491. Methods of Experimental Physics.

Prerequisites: Physics 453, 461. An advanced laboratory course required for majors and honours students. Experiments are selected from spectroscopy, electronics, solid state and nuclear physics. The student will be expected to perform altogether about eight experiments. Laboratory only. (Full course.)

**504 - Physics 291**
**504 - Physics 293** } See Faculty of Engineering.
**504 - Physics 391**

# Faculty of Commerce

## CURRICULUM FOR THE DEGREE OF BACHELOR OF COMMERCE

| General Curriculum | Honours in Economics | Major in Economics | Major in Accounting | Major in Management | Major in Finance | Major in Marketing | Major in Quant. Methods |
|---|---|---|---|---|---|---|---|
| FIRST YEAR | | | | | | | |
| 1. Maths. 251 or 450 or 451 | Maths. 251 | Maths. 251 | Maths. 251 | Maths. 251 | Maths. 251 | Maths. 251 | Maths. 251 |
| 2. English 211 | Eng. 211 | Eng. 211 | Eng. 211 | Eng. 211 | Eng. 211 | Eng. 211 | Eng. 211 |
| 3. Economics 211 | Econ. 211 | Econ. 211 | Econ. 211 | Econ. 211 | Econ. 211 | Econ. 211 | Econ. 211 |
| 4. Psychology 211 | Psych. 211 | Psych. 211 | Psych. 211 | Psych. 211 | Psych. 211 | Psych. 211 | Psych. 211 |
| 5. Accountancy 211 | Accty. 211 | Accty. 211 | Accty. 211 | Accty. 211 | Accty. 211 | Accty. 211 | Accty. 211 |
| SECOND YEAR | | | | | | | |
| 6. Accountancy 411 or Finance 416 | Accty. 411 or Fin. 416 | Accty. 411 or Fin. 416 | Accty. 411 — | Accty. 411 or Fin. 416 | Accty. 411 or Fin. 416 | Accty. 411 or Fin. 416 | Accty. 411 or Fin. 416 |
| 7. English Literature | Eng. Lit. | Eng. Lit. | Eng. Lit. | Eng. Lit. | Eng. Lit. | Eng. Lit. | Eng. Lit. |
| 8. Management 211 | Mgt. 211 | Mgt. 211 | Mgt. 211 | Mgt. 211 | Mgt. 211 | Mgt. 211 | Mgt. 211 |
| 9. Sociology 211 | Sociol. 211 | Sociol. 211 | Sociol. 211 | Sociol. 211 | Sociol. 211 | Sociol. 211 | Sociol. 211 |
| 10. Qu. Methods 242 or Maths. 441 | Q.M. 242 or Maths. 441 | Q.M. 242 or Maths. 441 | Q.M. 242 or Maths. 441 | Q.M. 242 or Maths. 441 | Q.M. 242 or Maths. 441 | Q.M. 242 or Maths. 441 | Q.M. 242 or Maths. 441 |
| 11. Econ. Elective** | Econ. 411 | Econ. 411 | Econ. 451 | Econ. Elect. | Econ. 451 | Econ. Elect. | Econ. Elect. |
| THIRD YEAR | | | | | | | |
| 12. Management 421 | Mgt. 421 | Mgt. 421 | Mgt. 421 | Mgt. 421 | Mgt. 421 | Mgt. 421 | Mgt. 421 |
| 13. Management 430 | Mgt. 430 | Mgt. 430 | Mgt. 430 | Mgt. 430 | Mgt. 430 | Mgt. 430 | Mgt. 430 |
| 14. Finance 413 | Fin. 413 | Fin. 413 | Fin. 413 | Fin. 413 | Fin. 413 | Fin. 413 | Fin. 413 |
| 15. Marketing 421 | Mktg. 421 | Mktg. 421 | Mktg. 421 | Mktg. 421 | Mktg. 421 | Mktg. 421 | Mktg. 421 |
| 16. Qu. Methods 411 | Q.M. 411 | Q.M. 411 | Q.M. 411 | Q.M. 411 | Q.M. 411 | Q.M. 411 | Q.M. 411 |
| 17. Elective*** | Econ. 452 | Econ. 451 or 452 | Accty. 412 | Mgt. 451 | Elect. | Elect. | Maths. 450 |
| FOURTH YEAR | | | | | | | |
| 18. Elective*** | Econ. 421 | Econ. 421 | Accty. 441* Accty. 421* | Mgt. 452 | Fin. 423 | Mktg. 451 | Q.M. 412 |
| 19. Elective*** | Econ. Elect. | Elect. | Accty. 431 | Mgt. 432 or 433 | Fin. 424 | Mktg. Elect. | Q.M. 421 |
| 20. Elective*** | Econ. Elect. | Elect. | Elect. | Elect. | Fin. 425 | Mktg. Elect. | Q.M. 442 |
| 21. Elective*** | Econ. ½ Cr. Selected ½ Cr. | Econ. ½ Cr. Selected ½ Cr. | Elect. | Elect. | Elect. | Elect. | Elect. |
| 22. Econ. Elective ** | Econ. Elect. | Econ. Elect. | Econ. Elect. | Econ. Elect. | Econ. Elect. | Econ. Elect. | Econ. Elect. |
| 23. Management 453 | Mgt. 453 | Mgt. 453 | Mgt. 453 | Mgt. 453 | Mgt. 453 | Mgt. 453 | Mgt. 453 |

**Half Course.*

***It is recommended that students select the two Economics courses from Economics 221, 271, 411, 424, 451, or 461.*

****The five electives may be selected from courses offered by any faculty. Two must be at the '400' level.*

# FACULTY OF COMMERCE

Gunther Brink, *Dean.*

NOTE:—Courses which are no longer offered and those whose titles and course numbers have been changed are listed on Page 264.

## PHILOSOPHY OF THE COMMERCE PROGRAMME

This Faculty is engaged in the education of students for business life. It is our intention to graduate students liberally educated about business. To accomplish this we have designed a multi-disciplinary and inter-disciplinary curriculum which is intellectually challenging.

The first two years of the programme are intended to provide an informative accumulation of operational attitudes, skills and tools which form the base for the core concentration.

The core concentration in the third year attempts to give broad experience in all phases of business in a co-ordinated, analytical and reflective period of study. All the resources of the student's intellectual ability are combined with his inter-disciplinary studies to analyze, formulate, judge, and solve challenging business situations.

The last year of the programme is intended to provide the student with an opportunity to immerse himself in ideas in depth when he elects an area for specialized study. In addition, the student participates in a course which is designed to test his ability to integrate his knowledge and to view the study of business as a whole.

## FRENCH LANGUAGE

The business community, as well as governments, now express a preference for university graduates who are bilingual. We, therefore, advise all students to take advantage of the opportunities available during their years at this University to ensure that they are bilingual when they present themselves for employment upon graduation.

## INTEGRATION OF PRESENT STUDENTS INTO THE NEW CURRICULUM

All students registered prior to the 1965/66 academic year have an approved programme of courses outlining their integration into the new curriculum. They will continue to follow their approved programme even though they may not have some of the specific prerequisites stated for various new courses.

Students preparing for the degree of Bachelor of Commerce will take 23 course credits as listed. A full credit represents three hours of class work per week for a full academic year. A three-hour course followed for one term only is therefore a half-course and represents a half credit.



## ADMISSION OR TRANSFER TO COMMERCE WITH ADVANCED STANDING

Students admitted to the Faculty of Commerce with advanced standing must satisfy a basic core requirement of 16 courses, as follows:

1. Mathematics 251
2. Economics 211
3. Economics Elective
4. Economics Elective
5. Accountancy 211
6. One of: Accountancy 411
   Finance 416
7. Management 211
8. Management 421
9. Management 430
10. Management 453
11. Quantitative Methods 242 or
    Mathematics 441
12. Quantitative Methods 411
13. Sociology 211
14. Psychology 211
15. Finance 413
16. Marketing 421

## THE INSTITUTE OF CHARTERED ACCOUNTANTS

Students holding the Bachelor of Commerce degree with a Major in Accountancy from Sir George Williams University at the time of registering with the Institute may apply for exemption from the intermediate examinations of the Institute of Chartered Accounts of Quebec, and from three of the five years of apprenticeship required for the C.A. certificate. The Faculty of Commerce will recommend exemption for students based on academic achievement. Generally speaking, an overall 'C' grade average is required.

## STUDENTS PLANNING GRADUATE STUDIES

Commerce students who expect to pursue postgraduate studies in business administration are generally advised to spend their undergraduate years in developing a broad and sound foundation in the social sciences and mathematics. The general commerce curriculum provides the necessary flexibility for this purpose. Majors in business subject areas such as accounting, management, finance and marketing are designed for students who intend to terminate their formal education with the bachelor degree.

Most Graduate Schools of Business require a 'B' average particularly in the last two years of the undergraduate programme as a basic entrance standard. In addition to this, candidates must write the Admission Test for Graduate Study in Business.

## UNDERGRADUATE COMMERCE DEGREE AND SCHOOL OF RETAILING DIPLOMA

Undergraduate commerce students under the following plan may obtain the Bachelor of Commerce degree and receive a Diploma from the School of Retailing in a four-year period. This plan for undergraduate commerce students will provide a high-standard retailing programme.

To achieve this result, two courses have been added to the Marketing Department, Marketing 471 and Marketing 481.

Students who undertake to receive the Bachelor of Commerce Degree and the Retailing Diploma simultaneously must have the equivalent of two summers of store experience, and follow the major in marketing curriculum, choosing, in place of the two open electives Marketing 471 and 481.

Undergraduate students must obtain the required store experience before entering third and fourth year. Students must make application to the Chairman of the Marketing Department during their second year to ensure summer store employment and admission to the special programme.

Please note that the School of Retailing also offers a two-year day programme leading to the Diploma in Retailing only. Applications should be made to the Director of the School of Retailing for this latter programme.

Students who hold a Bachelor of Commerce degree and who wish to receive the Retail Diploma, must complete or have completed the following or their equivalent: Marketing 421, 451, 471, 481 and two of the following: Marketing 431, 441, 461. These students must also have the required store experience.

## ACCOUNTANCY

James G. Finnie, *Professor of Accountancy and Chairman of the Department.*
Donald W. Burke, *Assistant Professor of Accountancy.*
Adam Dickie, *Assistant Professor of Accountancy.*
Frank P. Dougherty, *Assistant Professor of Accountancy.*
Harvey Mann, *Assistant Professor of Accountancy.*
E. Brian Markland, *Assistant Professor of Accountancy.*

### 800 - Accountancy 211. Accounting (Introductory)

An introductory course in accounting presenting the fundamental principles, emphasizing the application of those principles through modern procedure, applying the theory of double-entry with assets, liabilities, equity, income and expense accounts, utilizing special books of original entry, and controlling accounts, with emphasis on classification and disclosure in the preparation of financial statements. (Full course) with conference period when required.

### 800 - Accountancy 411. Accounting (Intermediate)

Prerequisite: Accountancy 211. A course continuing at a more advanced level the study begun in Accountancy 211, integrating the first-year work with more advanced theory and application, with emphasis on analytic method and interpretative processes, and relating particularly to procedural development while giving consideration to requirements of the companies acts. (Full course) with conference period when required.

### 800 - Accountancy 412. Accounting (Advanced)

Prerequisite: Accountancy 411. An advanced course in the principles of partnership formation, valuation, dissolution and liquidation; joint venture, consignments, installment sales, and insurance; bankruptcy, trusteeship, receivership and estates; preparation of statement of affairs, realization and liquidation reports; agency and branch accounting; parent and subsidiary accounting, including consolidations; special topics, and accounting theory. (Full course) with conference period when required.

### 800 - Accountancy 421. Cost Accounting (Introductory)

Prerequisite: Accountancy 411. This course provides a knowledge of the fundamentals of cost accounting; the essential records; and methods of arriving at cost, including the following: purposes of cost accounting; elements of cost; process cost systems; job cost systems; controlling accounts and the cost records; accounting for materials; material storage and consumption; perpetual inventories and stores control; valuation of materials; accounting for labour cost; wage systems; accounting for manufacturing expense; distribution of manufacturing expense to production; the cost to make and sell; sundry forms; monthly closing entries; preparation of operation and financial statements; and cost reports. A brief introduction to estimating and standard cost systems is also provided. (Half course.)



### 800 - Accountancy 422. Cost Accounting (Advanced)

Prerequisite: Accountancy 421. This course provides advanced and detailed knowledge of cost problems, records and practices, and cost accounting in relation to inventories, standard costs, budgetary control, and other devices of the various departments of a business, including the following: estimating cost systems; principles of standard costs, current and basic standards, variances, cost ratios, budgetary control; variable budgets; differential cost analyses; defective and spoiled work; by-products; idle and non-productive time; weighted averages; interest on investment; uniform cost methods; distribution and marketing costs; machine accounting; statistical and graphical cost reports; current cost accounting developments; statements; actual working out a practice job cost system. (Half course )

### 800 - Accountancy 431. Auditing and Investigation

Prerequisite: Accountancy 411. The principles underlying the practice of auditing, including the purposes and advantages of an audit; type of audits and examinations; qualifications of an auditor; preparatory considerations; the use of working papers and audit programmes; systems of internal check; the audit of asset, liability, revenue and expense accounts and of business transactions generally; forms of fraud and its detection; the legal duties and responsibilities of auditors, and auditors' reports and certificates; investigation types, procedures and reports. (Full course.)

### 800 - Accountancy 441. Taxation

Prerequisite: Accountancy 211. This course is devised to give authentic and up-to-date information on one of the major factors in business today. Discussion of problems is encouraged. Topics covered include corporation and personal income taxes and a survey of sales taxes, estate taxes and succession duties, and other levies. (Half course.)

Note:—Students who have credit for Commercial Law 441 may not take this course for credit.

### 800 - Accountancy 451. Machine Accounting and Other Machine Applications.

Prerequisite: Accountancy 411 or Finance 416. An introduction to the use of automatic and semi-automatic business machines in ledger keeping, billing, payroll, costing, process control, inventory records, report preparation, sales statistics and other applications. Emphasis is placed on the principles of integrated data processing through the use of punched cards, punched tape and magnetic tape. Several of the lectures will be delivered by specialists on specific types of machines. (Half course.)

## FINANCE

G. Robert Curnew, *Associate Professor of Finance and Chairman of the Department.*
John P. Castle, *Assistant Professor of Finance.*
James E. Hatch, *Lecturer in Finance.*

### 805 - Finance 416. Management Accounting

Prerequisite: Accountancy 211. A course designed for the non-accounting major. Emphasis is placed upon an understanding of accounting concepts to enable the student to interpret and evaluate accounting data. (Full course.)

NOTE:—Students majoring in Accountancy must take Accountancy 411. Students who have taken Accountancy 411 or Management 411 may not take this course for credit.

### 805 - Finance 413. Business Finance

Prerequisites: Economics 211, Accountancy 411, Management 411 or Finance 416; third-year standing. An introductory study of the role of fin nce in the business enterprise and the economy. Subject are covered from the viewpoints of the borrower and the lender and the effects on both by government and society. (Full course.)

NOTE:—Students who have credit for Finance 411 and/or Finance 412 may not take this course for credit.

### 805 - Finance 423. Financial Analysis and Interpretation

Prerequisite: Finance 413. A course of study in micro-financial and macro-financial analysis. Various measures are discussed as well as their sources and interpretations. (Full course.)

NOTE:—Students who have credit for Finance 421 and/or Finance 422 may not take this course for credit.

### 805 - Finance 424. Financial Management

Prerequisite: Finance 413. A study of the role and responsibility of the senior financial officer in the business enterprise. A variety of case studies is used to encourage the student to develop a critical approach to the subject. (Full course.)

### 805 - Finance 425. Financial Research

Prerequisite: permission must be obtained from the chairman of the department. In this course the student undertakes a research project and must demonstrate his ability to do original and independent work. (Full course.)

## MANAGEMENT

T. Kubicek, *Associate Professor of Management and Chairman of the Department.*
Gunther Brink, *Associate Professor of Management.*
Norman C. Fletcher, *Associate Professor of Management.*
Norman Bedford, *Assistant Professor of Management.*
Martin Franklin, *Assistant Professor of Management.*
Syed Hasan, *Assistant Professor of Management.*
Robert Hosein, *Assistant Professor of Management.*
Hem C. Jain, *Assistant Professor of Management.*
Peter E. Pitsiladis, *Assistant Professor of Management.*
Henry Tutsch, *Lecturer in Management.*

### 801 - Management 211. Commercial Law

A general survey of the law obtaining in the Province of Quebec with special emphasis on the aspects thereof relating to business and commerce. It includes a basic outline of the law of Domicile, Marriage, Persons, Property, Ownership and its modifications, Successions, Gifts and Wills, Testamentary Executors, Contracts, Quasi-Contracts, Offences and Quasi-Offences, Privileges, Hypothecs and Prescription, and a more detailed study of the Contracts of Sale, Lease and Hire of Things and of Work, Mandate, Loan, Deposit, Partnership, Suretyship, Pledge, Insurance, and an outline of the basic law applying to Negotiable Instruments, Joint Stock Companies, Bankruptcy and Winding Up, and Copyrights, Patents. and Trade Marks. It is strongly recommended that Accountancy 211 be taken before attempting this course. Taxation is covered in a separate course under Accountancy 441. (Full course.)

NOTE:—Students who have credit for Commercial Law 211 may not take this course for credit.



### 801 - Management 421. Production Management

Prerequisites: Economics 211, Accountancy 211, Accountancy 411 or Finance 416, or Management 411, Q.M. 242 or Mathematics 441 or Statistics 242. This course is concerned with the various aspects of production mnagement. Emphasis is placed on the problems of plant location and layout, product development and sale, materials handling, work simplification and the development of standards and controls. Class instruction methods will include the use of case studies and field trips. (Full course.)

NOTE:—Students who have taken Administration 251 or 421 may not take this course for credit.

### 801 - Management 430. Human Resources Management

Prerequisites: Psychology 211 and Sociology 211; third-year standing. This course attempts to give the student an awareness and understanding of the problems inherent in combining people and the machine process in formal organizations. Use will be made of the contributions of the behavioral sciences to understanding the human element from the viewpoint of the individual, the work group and the administrator. (Full course.)

NOTE:—Students who have taken Administration 441 or 430 may not take this course for credit.

### 801 - Management 432. Personnel Management

Prerequisite: Management 430 or Administration 430. This course deals with the personnel problems faced by all administrators in selecting, training, developing, motivating and assessing the performance of individuals within the interpersonal framework of organizations. The student will be exposed to the behavioral science literature which attempts to improve the task of utilizing human resources effectively. (Full course.)

NOTE:—Students who have taken Administration 431 or 432 may not take this course for credit.

### 801 - Management 433. Labour Relations

Prerequisite: Management 430 or Administration 430. The rise of unionism as an institution, collective bargaining, the effects of bargaining on the worker and management, labour legislation and future developments affecting the labour organization and management. (Full course.)

NOTE:—Students who have credit for Industrial Relations 411 or 412 or Administration 433 may not take this course for credit.

### 801 - Management 451. Social Aspects of Enterprise

Prerequisite: third-year standing in any faculty. The social and economic impact of the large corporation upon the community. Social responsibility of business, labour and government is considered as well as other future issues in the corporate society such as automation, leisure time and economic planning. (Full course.)

NOTE:—Students who have credit for Administration 451 may not take this course for credit.

### 801 - Management 452. Administrative Theory

Prerequisite: Management 430 or Administration 430. This course attempts to acquaint the student with the literature on organization and administration. Studies will be made on major authors such as Mayo, Barnard, Weber, Simon, McGregor, Taylor, Fayol and Drucker. (Full course.)

NOTE:—This course is intended for students majoring in Management. Students who have credit for administration 452 may not take this course for credit.

### 801 - Management 453. Business Policy

Prerequisite: fourth-year standing in Commerce. A terminal course designed to integrate the learning of the four-year programme. The emphasis will be on the administration of the organization through policy decisions as made by senior management. The student will be expected to demonstrate facility in analysis of business problems, in formulation of appropriate policies and in implementation of decision making. (Full course.)

NOTE:—Students who have credit for Administration 453 may not take this course for credit.

## MARKETING

Bruce Mallen, *Associate Professor of Marketing and Chairman of the Department.*
Harold Shaffer, *Assistant Professor of Marketing and Director of the School of Retailing.*
Paul R. Crocker, *Assistant Professor of Marketing.*
Ronald H. Rotenberg, *Lecturer in Marketing.*

### 808 - Marketing 421. Marketing (Introductory)

Prerequisites: Economics 211, Accountancy 211, Psychology 211 and Sociology 211. This course is designed to give the student a basic understanding of the marketing function and its role in the economic system. (Full course.)

NOTE:—Students who have credit for Marketing 211 and/or Marketing 411 may not take this course for credit.

Students should have completed a course in Statistics before taking this course.

### 808 - Marketing 431. Advertising and Sales Promotion

Prerequisite: Marketing 421. Advertising and sales promotion theory and practice. The objective is to give the student a broad perspective regarding the use of advertising and sales promotion. (Full course.)

NOTE:—Students who have credit for Marketing 221 and/or Marketing 222 may not take this course for credit.

### 808 - Marketing 441. Marketing Channels and Institutions

Prerequisite: Marketing 421. The course deals with the functions of the marketing channel and the various institutions which perform these functions. The problems of channel selection and channel administration are discussed, together with the roles of the industrial distributor, wholesaler, agent and retailer in the economic system. (Full course.)

NOTE:—This course is intended only for students majoring in Marketing.

### 808 - Marketing 451. Marketing Research

Prerequisite: Marketing 421. This course is designed to acquaint the student with the use of marketing research as an aid to management. This is a comprehensive survey of the scope and methods of marketing research. This course will include an introduction to scientific method and show the contributions of behavioral, managerial and mathematical sciences to marketing research. (Full course.)

NOTE:—Students who have credit for Marketing 412 may not take this course for credit.

### 808 - Marketing 461. Sales Management

Prerequisite: Marketing 421. The purpose of this course is to acquaint the student with the problems involved in the management of personal selling. The determination of the amount and allocation of personal sales effort to be applied to the market and the methods of organizing, evaluating and controlling this effort are discussed. Included in this course are such subjects as motivation, training, recruiting, selection, compensation, and supervision as applied to the sales force. (Full course.)

NOTE:—Students who have credit for Marketing 414 may not take this course for credit.



### 808 - Marketing 471. Retail Merchandising Techniques

Prerequisite: Marketing 421 to be taken previously or concurrently. This course is designed for students who expect to enter any marketing career. Study of the internal merchandise mechanism of various retail organizations through a detailed examination of the elements involved in sales, mark-ups, pricing, mark-downs; the function of cost and retail inventory valuations; the concept of stock turn; planning and control of sales, stocks, merchandise purchasing; model stock planning, expense planning and control. Problems illustrate how theory can be applied to in-store situations. (Full course.)

NOTE:—Students who have credit for Marketing 413 may not take this course for credit.

### 808 - Marketing 481. Retail Management

Prerequisites: Marketing 421, 471 and permission of the instructor. This course seeks to teach students how to cope successfully with management and administrative jobs at all retail levels. Typical retail management situations discussed through analysis of case histories. Emphasis is placed on such problems as merchandise selection and control, pricing, store policies, personnel management, operational problems of single and multi-unit retail organizations. (Full course.)

NOTE:—The instructor will only permit those having sufficient store experience to take this course. Students who have credit for Marketing 414 may not take this course for credit.

## QUANTITATIVE METHODS

Andrew Berczi, *Assistant Professor of Quantitative Methods and Chairman of the Department.*
Zoltan G. Popp, *Assistant Professor of Quantitative Methods.*
Roland O. Wills, *Assistant Professor of Quantitative Methods.*
Clarence Bayne, *Lecturer in Quantitative Methods.*
William Lawson, *Lecturer in Quantitative Methods.*

### 814 - Quantitative Methods 242. Introductory Business Statistics

Prerequisite: Mathematics 251. An introduction to statistical methods. The topics covered include: graphical and tabular presentation; scales of measurement; frequency distribution analysis; elementary probability theory; theoretical discrete and continuous distributions; sampling; point and confidence interval estimation; elementary hypothesis testing; linear regression and correlation; correlation of attributes; index numbers; time series and analysis; introduction to analysis of variance. (Full course.)

NOTE:—Students who have credit for Mathematics 241 or Statistics 242 may not take this course for credit.

### 814 - Quantitative Methods 411. Managerial Operations Research—Introductory

Prerequisites: Mathematics 251 or 450 or 451; Quantitative Methods 242 or Statistics 242 or Mathematics 241 or 441. A basic introduction to operations research including principles such as goals, policy payoff, feasibility and optimality, value and decision theory; methodology, such as models and flow charts, their formulation and verification; techniques such as mathematical programming, linear and dynamic; competitive strategies and statistical and simulation methods; and applications such as inventory, allocation, scheduling, queueing and replacement. (Full course.)

NOTE:—Students who have credit for Quantitative Analysis 411 may not take this course for credit.

### 814 - Quantitative Methods 412. Managerial Operations Research—Advanced

Prerequisite: Quantitative Methods 411. This course is an extension of Quantitative Methods 411. It aims to give the student a greater depth and understanding of Operations Research concepts, techniques and applications. Various mathematical methods (e.g. Matrix operations) are studied, also Critical Path, Pert Techniques and Non-linear programming. Information Theory, and various other O.R. tools are explored. The scope and limitations of O.R. are examined and the organization of O.R. work is discussed. The emphasis is on the development of the quantitative problem-solving ability of the student with special regard to practical applications in Finance, Marketing, Production and Administration. (Full course.)

### 814 - Quantitative Methods 421. Computers and Data Processing

Prerequisites: Accounting 411 or Finance 416 or Management 411; Quantitative Methods 411 or Quantitative Analysis 411. The development of the modern digital computer; basic electronic computer concepts; principles and characteristics of current equipment and programming techniques (Hardware and Software); scopes and limitations of computerization; techniques of business systems analysis and design, flow charts, logic diagrams, the importance of "standard"-s; a survey of various computer languages; problem definition and description in the two generalized programming languages; FORTNAR (Formula Translation) and COBOL (Common Business Oriented Language); various business applications—both in accounting and control—examined, analysed and exercised. (Full course.)

NOTE:—Emphasis is placed on the digital computer as a general purpose device for storing, retrieving, processing and transmitting information in addition to its role as an arithmetic calculator. Students who have credit for Computer Science 211, 212, 471, Mathematics 471 may not take this course for credit.

### 814 - Quantitative Methods 442. Advanced Business Statistics

Prerequisite: Quantitative Methods 242 or Statistics 242 or Mathematics 441. Simple and multistage sample and survey design; Design of Experiments. Non-linear, multiple and partial regression and correlation analysis. Exponential smoothing and advanced time series analysis, Statistical quality control. Non-parametric methods. The emphasis in this is on practical business applications; it is expected that the students acquire a good working knowledge of these techniques through extensive use of the statistical laboratory facilities. (Full course.)

## MATHEMATICS

### 502 - Mathematics 251. Fundamental Mathematics

This course is intended primarily for Commerce students, and includes selected topics from Algebra and Calculus as follows: sets; relations and functions and their graphs; straight line and circle; exponential and logarithmic functions; progressions; elementary theory of equations; inequalities; permutations, combinations and binominal theorem; limits and continuity; differentiation of rational, exponential, and logarithmic functions and applications; integration with applications. Lectures and practice period. (Full course.)

NOTE:—Students who do not have a good understanding of high school Mathematics should take Mathematics 201 before attempting Mathematics 251. Those interested in a full course in Calculus should follow the requirements outlined in this Announcement.

This course in under the Mathematics department and is included in this section only for information.



## COMPUTER SCIENCE

Courses in Computer Science are offered in the Faculty of Engineering and are available as electives to Commerce students. See page 209.

## ADDITIONAL COURSES OF STUDY

THE FOLLOWING COURSES ARE OFFERED TO MEET THE NEEDS OF VARIOUS BUSINESS ORGANIZATIONS. THEY DO NOT CARRY CREDIT TOWARDS THE BACHELOR OF COMMERCE DEGREE.

Students must consult the time-table to determine which of the following courses are offered in the current academic year.

### 813 - Business 221 (non-credit). Office Management

A course in the principles of office management, including such topics as the function of the office in business; organization and principles of control; office systems and routines; office equipment and labour-saving devices; office planning and layouts; selection and training of office personnel; office communications. (Full course.)

NOTE:—This course was previously designated as Administration 221. Students who have taken Administration 221 should not take this course.

### 813 - Business 222 (non-credit). Procurement Principles.

This course is designed to cover the fundamentals of purchasing policies and procedures and the organization and functions of the purchasing department in business and industry. Topics covered will include pricing, negotiation, quality and quantity determination, budgetary institutions, etc., as well as the relationship between purchasing and other management functions. Class discussion and case studies are the basic method of study employed. (Full course.)

NOTE:—This course was previously designated as Administration 442 and 443. Students who have taken Administration 442 and/or 443 should not take this course.

### 813 - Business 223 (non-credit). Business Systems

This course is designed primarily for students with practical business experience, managers, and potential systems men. It provides a *panoramic* view of the systems tools, techniques and equipment and relates them to practical situations arising in an enterprise in this age of change. Topics covered include: translation of management objectives into business systems, procedures and methods; organization planning; fact finding and related tools such as flow charting, work measurement, information requirement studies; selling, implementation and management of system and organization changes including planning, presentation and documentation tools such as critical path scheduling, decision table construction, procedure writing, project control techniques; information gathering, processing, distribution and retention equipment from simple office machines to computers. (Full course.)

NOTE:—This course was previously designated as Executive Training 441 and 442. Students who have taken Executive Training 441 and/or 442 should not take this course.

### 813 - Business 241 (non-credit). International Trade

The fundamental and practical aspects of importing and exporting, covering such subjects as trade terms and definitions, import and export regulations; export credits insurance; customs regulations; handling of export traffic; trading documents; aircargo and air express; marine insurance; financing. (Half course.)

NOTE:—This course was previously designated as Marketing 241. Students who have taken Marketing 241 should not take this course.

### 813 - Business 251 (non-credit). Transportation and Traffic (Introductory)

This course in freight traffic management is primarily for students who wish to specialize in this line of endeavour. It covers the practical aspects of transportation in Canada including such matters as bills of lading and shipping procedures; special services of railways; express; claims and claims preventions; freight contracts; marine insurance; customs; interpretation of the railway act and railway law. (Full course.)

NOTE:—This course was previously designated as Marketing 251. Students who have taken Marketing 251 should not take this course.

### 813 - Business 252 (non-credit). Transportation and Traffic (Advanced)

Prerequisite: Business 251. This course in freight traffic management is primarily for students who wish to specialize in this line of endeavour. It covers the practical aspects of transportation in Canada including such matters as tariff construction and freight rate structures; condition of carriage; ocean freight contracts; marine insurance; customs; interpretation of the railway act and railway law. (Full course.)

NOTE:—This course was previously designated as Marketing 252. Students who have taken Marketing 252 should not take this course.

### 813 - Business 260 (non-credit). Basic Mathematics for Business

Review of elementary algebraic operations; fractions, ratios, proportions, percentages, simple equations, arithmetic and geometric progressions, logarithms; graphical algebra; simple and compound interest; annuities, amortization and sinking funds, depreciation and bond values; simple business statistics including: the collection of statistical data, various methods of presentation including tables and graphs, the frequency distribution and its mathematical analysis including averages, measures of dispersion, measures of skewness, normal curve, and correlation. (Full course.)

## SPECIAL CERTIFICATE PROGRAMMES

There are many organizations within the business community designed to serve the needs of people working in specialized areas of business. These organizations recognize that the educational qualifications of those seeking membership must be continually upgraded. Therefore, they sponsor an Academic Certificate which may be obtained through correspondence courses or through a lecture programme.

The Faculty of Commerce co-operates with these business organizations by permitting personnel to register as partial students, and to take courses leading to a Certificate to be awarded by the organization concerned.

Students must comply with the University regulations regarding dates of application and partial student entrance requirements as outlined in the University Announcement. In addition to this, they must meet the requirements of the specific organization.

The credit courses taken may be applied towards the Bachelor of Commerce degree provided the student meets the admission requirements and wishes to transfer from partial status to undergraduate status after completing a Certificate programme. Students are advised that they must meet the Bachelor of Commerce curriculum requirements in force at the date of transfer.



Each Certificate programme has one or more special courses required to complete the programme. *These courses do not carry credit toward a Bachelor's degree and are designated as Non-Credit courses.*

Students interested in the following Certificate programmes should obtain details from the organization concerned or the Commerce Faculty office:

1. A.M.S. — The Administrative Management Society (Montreal Chapter) Inc.
2. M.P.A. — The Montreal Personnel Association.
3. A.M.A. — The American Marketing Association (Montreal Chapter).*
4. C.A.P.A. — The Canadian Association of Purchasing Agents (Montreal Division).
5. D.P.M.A.— Data Processing Management Association (Montreal Chapter).

* *formerly the Marketing Association of Canada (M.A.C.)*

## COURSES REQUIRED

| A.M.S. | M.P.A. | A.M.A. | C.A.P.A. | D.P.M.A. |
|---|---|---|---|---|
| Accty. 211<br>Econ. 211<br>Eng. 211<br>Mgt. 211<br>Psych. 211<br>Mgt. 432*<br>Fin. 413*<br>Mktg. 421*<br>French 211*<br>NC Bus. 221<br>NC Bus. 223*<br>NC Bus. 260* | Econ. 211<br>Econ. 271<br>Sociol. 211<br>Psych. 211<br>Mgt. 430<br>Mgt. 432<br>Mgt. 433<br>Mgt. 452 | Accty. 211<br>Econ. 211<br>Sociol. 211<br>Psych. 211<br>Mktg. 421<br>Mktg. 431<br>Mktg. 451<br>Mktg. 461<br>NC Bus. 260 | Accty. 211<br>Econ. 211<br>Mgt. 211<br>Psych. 211<br>Chem. 211<br>or<br>Physics 211<br>NC Bus. 222<br>NC Bus. 260 | Accty. 211<br>Accty. 451†<br>Mgt. 421<br>Fin. 416<br>Maths. 251<br>Q.M. 242<br>Q.M. 411<br>Q.M. 421<br>NC Bus 223<br>NC Bus 260 |
| Required 6<br>*Electives any 4 | 8<br>... | 9<br>... | 7<br>... | 9½<br>... |
| TOTAL 10 | 8 | 9 | 7 | 9½ |

†*Half-course*

The following organizations co-operate in offering courses as continuing education:

1. The International Trade Section of the Montreal Board of Trade:
   Business 241 (non-credit). International Trade.
2. The Canadian Industrial Traffic League, (Quebec Division):
   Business 251 (non-credit). Transportation and Traffic (Introductory).
   Business 252 (non-credit). Transportation and Traffic (Advanced).
3. The Systems and Procedures Association of America, (Montreal Chapter):
   Business 223 (non-credit). Business Systems.

The following organizations suggest that students take certain courses at this University as preparation for their uniform final examinations:

1. The Society of Industrial and Cost Accountants of Quebec.
2. Association of Certified General Accountants (Quebec Division).
3. Association of Chartered Institute of Secretaries (Quebec Division).

# Faculty of Engineering

## ADMISSION TO UNDERGRADUATE STANDING IN ENGINEERING

### Admission to First Year

Students must present satisfactory proof of graduation from high school with an average of at least 60% on ten academic papers on the Quebec High School Leaving examinations, or the equivalent, including papers in English Literature and Composition, Algebra, Geometry, and at least one Science. Students are also eligible to enter first-year Engineering under "Early Final Admission" regulations as per Page 49.

### Admission directly to Second Year

A student presenting a Quebec Senior High School Leaving Certificate or equivalent, including English Literature and Composition, Physics, Chemistry, and at least Intermediate Algebra, Analytic Geometry, and Trigonometry (on either Junior or Senior Matriculation Certificates), will be considered for admission to second year.

Students admitted in this manner will take Engineering 212 in second year, in lieu of English Composition, from which they will already have received exemption.

### Admission as a Partial Student in the Evening Division

Evening Division courses in the Faculty of Engineering are normally taken as part of the undergraduate programme leading to the Certificate in Engineering, or to the Bachelor of Engineering. However, suitably qualified applicants interested in single courses are encouraged to register for such courses in the Evening Division. This may be particularly suitable for individuals preparing to write the examinations of the Corporation of Engineers of Quebec or intending to apply for admission to the Master of Engineering programme at Sir George Williams University.

The University reserves the right of decision on the applicant's eligibility for each individual course. Priority will be given to students registered as undergraduates in the Certificate or Degree programmes.

### Course Load

Day Division students will take the courses of each year as indicated in the tables which follow.

Evening Division students in first year will take no more than three courses each calendar year. The second-year programme may be taken over two calendar years, the third-year programme over either two or three calendar years. The particular patterns of courses to be taken in each of the calendar years are listed in the University timetable.



Students wishing to work at a slower pace should plan their programmes carefully, with guidance from the Dean of the Faculty or his delegate, since some courses are not offered every year.

It is worth noting that each lecture hour is expected to require about two additional hours of "outside" work, and most laboratory hours about one half-hour of "outside" work.

### Failures

A student in Engineering who fails more than two full courses has failed the year and must repeat it (if permitted to do so) for credit.

### Supplemental Examinations

A student in Engineering may write supplemental examinations in not more than two full courses, and not more than three papers, each year.

## CURRICULUM FOR THE DEGREE OF BACHELOR OF ENGINEERING

The University offers a five-year programme leading to the degree of Bachelor of Engineering in the fields of Civil, Electrical, and Mechanical Engineering. The curriculum is based on a uniform pattern of courses for all students in the first three years, followed by two years of specialized work in the particular professional field chosen by the student.

A special feature of the programme is the early introduction of a "physical systems approach" as a unifying theme, concurrent with a related sequence of laboratory courses designed to emphasize a concern for the problems of measurement and associated instrumentation. Students may elect to follow course sequences designed to provide modern education in the traditional engineering disciplines, or they may elect to concentrate on systems engineering in considerable depth.

The first three years of this programme are offered in both Day and Evening Divisions, whereas the final two years are available in the Day Division only. Evening students are eligible to transfer to the Day Division upon completion of any of the three full academic years.

Successful completion of the degree programme in Engineering requires hard work and considerable dedication on the part of each student. The curriculum is designed with the expectation of about two hours of "outside" work for each lecture hour, on average. Most laboratory courses will normally require about one half-hour of "outside" work for each hour spent in the laboratory.

## French Language Requirement

All Engineering students are required to pass a French language examination at some time following first year Engineering and prior to graduation. Examinations will be held in the Fall and Spring terms of each year. It is suggested that French 211 be taken as the third-year optional course by students who do not have sufficient background in the French language. Foreign students attending the University on a student visa will be exempt from this requirement on request.

NOTE:—Time distribution for courses shown below is intended as a guide to Day Division students.

### First Year Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Chem 211 | General Chemistry | 3 | 2 | 3 | 2 |
| *Math 213 | Algebra | 3 | 0 | 3 | 0 |
| *Math 223 | Analytical Trigonometry & Geometry | 3 | 0 | 3 | 0 |
| Phys 211 | General Physics | 3 | 2 | 3 | 2 |
| Engin 212 | Engineering Graphics | 2 | 2 | 2 | 2 |
| **English 222 or 221 or French 221, 222 or 231 | Literature | 3 | 0 | 3 | 0 |
| | | 17 | 6 | 17 | 6 |

* *A student who has completed high school Trigonometry and Intermediate Algebra with a grade of 65% or more may substitute Mathematics 233.*

***A student whose secondary education has been completed in another language may substitute an optional course in the Faculty of Arts.*

*A student whose knowledge of the English language is judged to be inadequate will be required to register for English 200 as a first-year course. Literature, for such a student, will then be considered a second-year requirement.*



### Second Year Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Math 291 | Analytic Geometry & Vector Analysis | 3 | 0 | 3 | 0 |
| Math 292 | Calculus | 3 | 0 | 3 | 0 |
| Phys 291 | Sound and Light | 3 | 3 | — | — |
| Phys 293 | Electricity and Magnetism | — | — | 3 | 3 |
| Engin 214 | Digital Computer Programming | 2 | 2 | — | — |
| Engin 221 | Materials Science | 3 | 1.5 | 3 | 1.5 |
| Engin 241 | Statics | — | — | 4 | 0 |
| *English 211 | College Composition | 3 | 0 | 3 | 0 |
| | | 17 | 6.5 | 19 | 4.5 |

* *A student whose native language is not English may satisfy the College Composition requirement by satisfactorily completing English 200 or English 201. See note under "First Year Engineering".*

### Third Year Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Math 391 | Advanced Calculus | 2 | 0 | 2 | 0 |
| Math 392 | Differential Equations | 2 | 0 | 2 | 0 |
| Phys 391 | Modern Physics | — | — | 2 | 0 |
| Engin 341 | Dynamics | 4 | 0 | — | — |
| Engin 343 | Mechanics of Materials I | — | — | 4 | 3 |
| Engin 350 | Thermodynamics I | 3 | 0 | — | — |
| Engin 351 | Fluid Mechanics I | — | — | 3 | 0 |
| **Engin 371 | Digital Computer Programming | 2 | 2 | — | — |
| Engin 372 | Physical Systems & Measurements | 3 | 3 | 3 | 3 |
| * | Elective | 3 | 0 | 3 | 0 |
| | | 19 | 5 | 19 | 6 |

* *One full course taken in any faculty, excluding courses required in Engineering curriculum.*

***Taken as a third-year course in 1967-68 only.*

## Fourth Year Civil Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Engin 441 | Mechanics of Materials II | 3 | 0 | — | — |
| Engin 451 | Fluid Mechanics II | 3 | 1.5* | — | — |
| Engin 471 | Physical Systems & Measurements II | 3 | 3 | — | — |
| Engin 491 | Mathematical Methods in Engineering | 3 | 0 | 3 | 0 |
| Civ Eng 421 | Engineering Materials | 1 | 3 | 1 | 3 |
| Civ Eng 431 | Geology | — | — | 2 | 1.5* |
| Civ Eng 451 | Theory of Structures I | 3 | 0 | 3 | 0 |
| Civ Eng 452 | Structural Design I | — | — | 2 | 3 |
| Civ Eng 461 | Hydrology | — | — | 3 | 1.5* |
| Civ Eng 471 | Surveying I | x | x | — | — |
| Civ Eng 472 | Highway Engineering I | — | — | 3 | 1.5* |
| | | 16 | 7.5 | 17 | 10.5 |

x *Surveying I is a Summer School taken prior to start of Fall term.*
* *3 hours per week, alternate weeks.*



## Fifth Year Civil Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Engin 501 | Engineering Economy & Practice | 3 | 0 | 3 | 0 |
| Engin 510 | Technical Report | x | x | — | — |
| Civ Eng 531 | Soil Mechanics I | 3 | 3 | — | — |
| Civ Eng 532 | Foundations | — | — | 3 | 1.5* |
| Civ Eng 541 | Experimental Stress Analysis | — | — | 1 | 3 |
| Civ Eng 551 | Structural Design II | 0 | 6 | — | — |
| Civ Eng 552 | Reinforced Concrete | 2 | 3 | 2 | 3 |
| Civ Eng 561 | Hydraulic Engineering I | 3 | 0 | — | — |
| Civ Eng 562 | Water Resources | — | — | 2 | 0 |
| Civ Eng 571 | Highway Engineering II | 3 | 0 | — | — |
| Civ Eng 581 | Public Health Engineering | 3 | 1.5* | 3 | 0 |
| ** | Technical Elective | — | — | 3 | 0 |
| | | 17 | 13.5 | 17 | 7.5 |

**TECHNICAL ELECTIVES

| | | | |
|---|---|---|---|
| Civ Eng 533 | Soil Mechanics II | 3 | 0 |
| Civ Eng 553 | Theory of Structures II | 3 | 0 |
| Civ Eng 563 | Hydraulic Engineering II | 3 | 0 |

x *Report submitted prior to start of Fall term.*
* *3 hours per week, alternate weeks.*

## Fourth Year Electrical Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Engin 471 | Physical Systems & Measurements II | 3 | 3 | — | — |
| Engin 472 | Control Theory I | — | — | 3 | 3 |
| Engin 491 | Mathematical Methods in Engineering | 3 | 0 | 3 | 0 |
| Engin 492 | Advanced Mathematics | 2 | 0 | — | — |
| Engin 501 | Engineering Economy & Practice | 3 | 0 | 3 | 0 |
| Elec Eng 421 | Electronics I | 3 | 3 | — | — |
| Elec Eng 422 | Electronics II | — | — | 3 | 3 |
| Elec Eng 431 | Electromechanics I | 3 | 3 | — | — |
| Elec Eng 441 | Network Analysis | — | — | 3 | 0 |
| ** | Technical Elective | — | — | 3 | 1.5* |
| | | 17 | 9 | 18 | 7.5 |

**TECHNICAL ELECTIVES

*One* course chosen from:

| | | | | | |
|---|---|---|---|---|---|
| Elec Eng 432 | Electromechanics II | | | 3 | 1.5* |
| Elec Eng 451 | Electromagnetic Field Theory | | | 3 | 1.5* |

* *3 hours per week, alternate weeks.*



## Fifth Year Electrical Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Engin 510 | Technical Report | x | x | — | — |
| Elec Eng 501 | Seminar | — | — | 0 | 2 |
| Elec Eng 511 | Electrical Properties of Matter | 3 | 0 | — | — |
| Elec Eng 521 | Electronics III | 3 | 3 | — | — |
| Elec Eng 561 | Communication Theory | 3 | 3 | — | — |
| Elec Eng 581 | Electrical Engin Design Project | — | — | 0 | 6 |
| ** | Technical Electives | ** | ** | ** | ** |
| | Arts Faculty Elective | 3 | 0 | 3 | 0 |

**TECHNICAL ELECTIVES

*First Term*

*Two* courses chosen from:

| | | | | | |
|---|---|---|---|---|---|
| Engin 441 | Mechanics of Materials II | 3 | 0 | — | — |
| Engin 511 | Computer Organization & Software | 3 | 1.5 | — | — |
| Engin 571 | Control Theory II | 3 | 1.5* | — | — |
| Elec Eng 551 | Electromagnetic Wave Propagation | 3 | 1.5* | — | — |
| Elec Eng 571 | Electrical Power Systems | 3 | 1.5* | — | — |

*Second Term*

*Four* courses chosen from:

| | | | | | |
|---|---|---|---|---|---|
| Engin 512 | Operations Research | | | 3 | 1.5 |
| Engin 572 | Control System Design | | | 3 | 1.5* |
| Engin 573 | Advanced System Theory | | | 3 | 1.5* |
| Engin 575 | Digital Computers in Systems | | | 3 | 1.5* |
| Elec Eng 432 | Electromechanics II | | | 3 | 1.5* |
| Elec Eng 451 | Electromagnetic Field Theory | | | 3 | 1.5* |
| Elec Eng 532 | Generalized Machine Theory | | | 3 | 1.5* |
| Elec Eng 552 | Microwave Design | | | 3 | 1.5* |
| Elec Eng 562 | Statistical Communication Theory | | | 3 | 1.5* |

x *Report submitted prior to start of Fall term.*
* *3 hours per week, alternate weeks.*

## Fourth Year Mechanical Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Engin 441 | Mechanics of Materials II | 3 | 0 | — | — |
| Engin 451 | Fluid Mechanics II | 3 | 1.5* | — | — |
| Engin 471 | Physical Systems & Measurements II | 3 | 3 | — | — |
| Engin 472 | Control Theory I | — | — | 3 | 3 |
| Engin 491 | Mathematical Methods in Engineering | 3 | 0 | 3 | 0 |
| Engin 492 | Advanced Mathematics | 2 | 0 | — | — |
| Elec Eng 431 | Electromechanics I | 3 | 3 | — | — |
| Mech Eng 412 | Mechanical Engineering Lab I | — | — | 0 | 3 |
| Mech Eng 421 | Metallurgy | — | — | 3 | 1.5 |
| Mech Eng 443 | Kinematics of Machines | 1 | 3 | — | — |
| Mech Eng 444 | Dynamics of Machines | — | — | 3 | 3 |
| Mech Eng 451 | Thermodynamics II | — | — | 3 | 0 |
| Mech Eng 453 | Heat Transfer I | — | — | 3 | 0 |
| | | 18 | 10.5 | 18 | 10.5 |

* *3 hours per week, alternate weeks.*



## Fifth Year Mechanical Engineering

| | | 1st Term | | 2nd Term | |
|---|---|---|---|---|---|
| | | Lec Hrs | Lab Hrs | Lec Hrs | Lab Hrs |
| Engin 501 | Engineering Economy & Practice | 3 | 0 | 3 | 0 |
| Engin 510 | Technical Report | x | x | — | — |
| Mech Eng 511 | Mechanical Engineering Lab II | 0 | 3 | 0 | 3 |
| Mech Eng 541 | Machine Design I | 3 | 3 | — | — |
| Mech Eng 542 | Machine Design II | — | — | 3 | 3 |
| Mech Eng 551 | Gas Dynamics | 3 | 0 | — | — |
| Mech Eng 552 | Heat Transfer II | 3 | 0 | — | — |
| Mech Eng 553 | Fluid Machinery | — | — | 3 | 0 |
| ** | Technical Electives | ** | ** | ** | ** |

**TECHNICAL ELECTIVES

*First Term*

*Two* courses chosen from:

| | | | | | |
|---|---|---|---|---|---|
| Engin 511 | Computer Organization & Software | 3 | 1.5 | — | — |
| Engin 571 | Control Theory II | 3 | 1.5* | — | — |
| Civ Eng 421 | Engineering Materials | 1 | 3 | 1 | 3 |
| Civ Eng 451 | Theory of Structures I | 3 | 0 | 3 | 0 |
| Elec Eng 421 | Electronics I | 3 | 3 | — | — |
| Mech Eng 521 | Manufacturing Processes | 3 | 0 | — | — |
| Mech Eng 554 | Environmental Control | 3 | 0 | — | — |

*Second Term*

*Three* courses chosen from:

| | | | | | |
|---|---|---|---|---|---|
| Engin 512 | Operations Research | — | — | 3 | 1.5 |
| Engin 572 | Control System Design | — | — | 3 | 1.5* |
| Engin 575 | Digital Computers in Systems | — | — | 3 | 1.5* |
| Civ Eng 421 | Engineering Materials | 1 | 3 | 1 | 3 |
| Civ Eng 451 | Theory of Structures I | 3 | 0 | 3 | 0 |
| Civ Eng 452 | Structural Design I | — | — | 2 | 3 |
| Civ Eng 541 | Experimental Stress Analysis | — | — | 1 | 3 |
| Elec Eng 422 | Electronics II | — | — | 3 | 3 |
| Elec Eng 432 | Electromechanics II | — | — | 3 | 1.5* |
| Mech Eng 555 | Energy Conversion | — | — | 3 | 0 |

x *Report submitted prior to start of Fall term.*
* *3 hours per week, alternate weeks.*

## CERTIFICATE OF ENGINEERING

Evening Division students who have satisfactorily completed the first three academic years, will be granted the Certificate in Engineering upon application to the Registrar. They may continue their studies toward the Bachelor of Engineering degree by transfer to the Day Division, or if they wish, they may be admitted to the Faculty of Science, and continue their studies in the Evening Division to earn the Bachelor of Science Degree. This will normally require a further five-course academic year.

## MASTER OF ENGINEERING

The Faculty of Engineering will offer an evening programme leading to the degree of Master of Engineering, commencing in the 1968-69 academic year. Potential applicants are encouraged to enroll for appropriate refresher courses from among those offered to evening undergraduates in Engineering during the 1967-68 session. Particular attention is drawn to the need for adequate mathematical preparation and a knowledge of computer programming. Further information may be obtained from the office of the Dean of Engineering.

### ADMISSION

Applicants must hold a Bachelor's Degree in Engineering, or equivalent, with high standing from a recognized University, and be currently employed in Engineering. Due to the rapid change in undergraduate course content, applicants with inadequate undergraduate training will be required to take specified undergraduate courses before being admitted as Master of Engineering candidates. In particular, candidates will be expected to be familiar with computer programming systems.

### CURRICULUM

I - 901 - **Engineering 611 - Engineering Analysis**

II - **Elective Courses** - Four full courses chosen from among those listed.

As the programme develops courses will be offered in a number of Engineering disciplines. Course work likely to be available over the next few academic years will be drawn from among those listed below. It should of course be noted that only a limited number of course offerings will be available in any given academic year:

Mechanics of Continuous Media; Dynamics of Structures; Analysis of Continuous Trusses and Truss Frames; Theory of Space Frames; Plates and Shells; Theory of Elasticity; Vibrations; Analytical Dynamics; Dynamics of Machines; Machine Design; Engineering Materials; Mechanics of Soil Media; Mass, Heat and Momentum Transfer; Fluid Mechanics; Hydraulics of Open Channels; Applied Statistics in Hydrology; Hydraulic Structures; Electromechanical Systems; Electromagnetic Theory; Control Systems; Switching Circuit Theory; Semiconductor Electronics.

With the cooperation of the Faculty of Engineering at McGill University it will be possible to include the equivalent of one full course from among the current post-graduate offerings at McGill University, provided approval for such course work is obtained from the candidate's Faculty Advisor prior to registration at Sir George Williams University.



III - **A Dissertation** - which may be based upon one of the following:

(a) a theoretical study;

(b) a research, design, or development project conducted in Sir George Williams University Engineering laboratories;

(c) a research, design or development project conducted as part of the full-time employment of the candidate. Permission to submit a dissertation in this category must be received in advance. Permission will be granted only in the event that:

(i) the candidate's employer submits written approval for the pursuit and reporting of such work;

(ii) the candidate has adequate research and development facilities, as judged by the Engineering Faculty Graduate Studies Committee;

(iii) arrangements can be made for supervision of the project by a Faculty Advisor;

(iv) where appropriate to the situation, the candidate has direct supervision on the job by a qualified supervisor, as judged by the Committee.

(d) a critical review of existing knowledge.

The dissertation must represent the results of the candidates independent work undertaken after admission to graduate studies at Sir George Williams University. Work previously published by the candidate may be used only as introductory or background material for the dissertation.

IV - Candidates must present satisfactory evidence of a reading knowledge of the French language. A special examination for this purpose may be required.

### COURSE LOAD AND RESIDENCE REQUIREMENTS

Normally a candidate will take only Part I during his first year of study, unless he is a recent graduate. In any event, candidates may register in no more than two subjects concurrently. The minimum residence period is thus three academic years. Candidates will be required to complete the programme within a five-year period.

## FACULTY OF ENGINEERING

Jack Bordan, *Dean.*

F. A. Gerard, *Professor of Engineering.*
J. Clair Callaghan, *Associate Professor of Engineering.*
Matthew McC. Douglass, *Associate Professor of Engineering.*
Morne P. du Plessis, *Associate Professor of Engineering.*
Norman F. Jennings, *Associate Professor of Engineering.*
Mete Yalcin, *Associate Professor of Engineering (on leave of absence 1967-68).*
Ishaq Baluch, *Assistant Professor of Engineering.*
James G. Dick, *Assistant Professor of Chemistry and Materials Science.*
James F. Lindsay, *Assistant Professor of Engineering.*
Graham Martin, *Assistant Professor of Engineering and Director of the Computer Centre.*
Victor R. Riley, *Assistant Professor of Engineering.*
S. Ahmed Rizvi, *Assistant Professor of Engineering.*
Albert I. Tari, *Assistant Professor of Engineering.*
George D. Xistris, *Sessional Lecturer in Engineering.*

The present system of numbering Engineering courses was instituted in 1965-66. For course listings under the previous four-digit system see the 1965-66 University Announcement.

Hours listed for courses below are intended to indicate total "term-hours"; e.g., a course listed as 2 hours per week, 2 terms, may be given as 4 hours per week, 1 term.

## CHEMISTRY

**503 - Chemistry 211 - General Chemistry** — See Faculty of Science.

**503 - Chemistry 230 - Physical Chemistry**

Thermochemistry: thermodynamics; chemical equilibria; chemical kinetics.

Lectures: 2 hours per week, 2 terms.

This course is no longer offered. See Engineering 221 and 350.

## MATHEMATICS

**502 - Mathematics 213. Algebra** — See Faculty of Science.

**502 - Mathematics 223. Analytical Trigonometry and Geometry**—See Faculty of Science.

**502 - Mathematics 233. Algebra and Analytical Geometry**—See Faculty of Science.

**502 - Mathematics 291. Analytic Geometry and Vector Analysis**

Elementary operations on vectors; applications to geometrical proofs; analytic geometry in space; solution of problems using vector methods; systems of linear equations, homogeneous and nonhomogeneous; determinants; elementary matrix algebra.

Lectures: 3 hours per week, 2 terms.

**502 - Mathematics 292. Calculus**

Limits; differentiation and integration of elementary functions; applications to maxima, minima, time-rates; errors and approximations; sequences; infinite series.

Lectures: 3 hours per week, 2 terms.

**502 - Mathematics 391. Advanced Calculus**

Functions of more than one variable; limits; continuity; partial differentiation; multiple integrals; advanced vector analysis; the complex differential and integral calculus.

Lectures: 2 hours per week, 2 terms.

**502 - Mathematics 392. Differential Equations**

Differential equations of the first order; solution of homogeneous and non-homogeneous linear equations with constant coefficients; operator methods; solution by Laplace transforms; equations of higher order; solutions of linear equations by series methods; Fourier series; partial differential equations.

Lectures: 2 hours per week, 2 terms.



## PHYSICS

**504 - Physics 211. General Physics**—See Faculty of Science.

**504 - Physics 291. Sound and Light**

Simple harmonic motion using methods of calculus; waves; Huygen's principle, interference and diffraction of sound and light; acoustics; lenses and mirrors; aberrations; the eye; illumination; polarization; origin of spectra.

Lectures: 3 hours per week, 1 term.
Laboratory: 2 hours per week, 1 term.

**504 - Physics 293. Electricity and Magnetism**

A study of electricity and magnetism leading to Maxwell's equations in integral form. Electric forces and fields; equipotentials and flux lines; electric flux and Gauss' Law; energy in an electric field. Conduction in vacuum and material media; semiconductors. Magnetic field of a current; magnetic flux; flux lines; energy in a magnetic field; Faraday's Law; Maxwell's equations.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

**504 - Physics 391. Modern Physics**

Elementary particles; atomic structure; X-rays; Compton effect; photo-electric effect; atomic spectra; Schrodinger equation; nuclear reactions.

Lectures: 2 hours per week, 1 term.

## ENGINEERING — GENERAL

**901 - Engineering 212. Engineering Graphics**

Draughting techniques; use of instruments; lettering; dimensioning; conventions; sketching; orthographic projection; sections; auxiliary views; solution of problems involving points, lines, planes, solids; revolution; common machine elements.

Lectures and draughting room: 4 hours per week, 2 terms.

**901 - Engineering 214. Digital Computer Programming**

An introductory course in Computer programming and Computer use oriented to Engineering applications. This course teaches sufficient Fortran programming to enable students to use computers in Engineering studies and subsequent work.

Lectures: 2 hours per week, 1 term.
Laboratory: 2 hours per week, 1 term.

This course formerly offered as Engineering 371.

### 901 - Engineering 221. Materials Science

Liquid and solid states; liquefaction, Van der Waal's equation, vapour pressure, surface tension, heat capacity. Partial vapour pressures, ideal and non-ideal solutions, distillation, boiling and freezing point laws, equilibrium constants and standard free energy tables.

Atomic and molecular structures; crystalline and amorphous structures, the mechanical, electrical, chemical, magnetic, thermal, optical properties of metals and non-metals as related to structure. Phase diagrams, order-disorder transitions. Corrosion. Selection of materials in engineering design.

Lectures: 3 hours per week, 2 terms.
Laboratory: 1½ hours per week, 2 terms.

### 901 - Engineering 241. Statics

Static equilibrium; analysis of simple plane and space structures; friction.

Lectures: 2 hours per week, 2 terms.

This course formerly offered as Civil Engineering 241.

### 901 - Engineering 331. Technical Report

This course now offered as Engineering 510.

### 901 - Engineering 341. Dynamics

The mechanics of systems of particles and rigid bodies; variable rectilinear and curvilinear motion; relative motion with respect to translating and rotating axes; vibration; gyroscopic motion. Vector calculus used freely where appropriate.

Lectures: 2 hours per week, 2 terms.

This course formerly offered as Civil Engineering 341.

### 901 - Engineering 343. Mechanics of Materials I

Stress, strain and elasticity; analysis and design of structural and machine elements subjected to axial, torsional, and bending loads; shear and bending moment diagrams; deflections; analysis of statically indeterminate systems; combined stresses; composite beams.

Lectures: 2 hours per week, 2 terms.
Laboratory: 3 hours per week, 1 term.

This course formerly offered as Civil Engineering 343.

### 901 - Engineering 350. Thermodynamics I

Control volume approach to thermodynamic laws; irreversibility and availability; vapour and air standard power and refrigeration cycles.

Lectures: 3 hours per week, 1 term.

This course formerly offered as Mechanical Engineering 331.

### 901 - Engineering 351. Fluid Mechanics I

Fluid properties and flow characteristics, fluid statics, kinematics of flow, dynamics of flow, dimensional analysis and similitude, characteristics of real flow, flow in ducts.

Lectures: 3 hours per week, 1 term.

### 901 - Engineering 371. Digital Computer Programming

This course now offered as Engineering 214.



### 901 - Engineering 372. Physical Systems and Measurements I

An integrated sequence of three terms (Engineering 372 and 471) containing the theory and analysis of lumped parameter linear systems and the application of these principles to problems of physical measurements. Characteristics and classification of physical systems, principles of network analysis, network representation of physical systems. Background mathematics, complete solution of simple physical systems, simulators, sinusoidal steady state excitation.

Error and statistical analysis, network theorems, cathode ray oscilloscope, potentiometer, two-terminal-pair networks, characteristics of curves, Transients, periodic waveforms, A.C. and D.C. bridges (balanced and unbalanced), measurement of strain, analog computer, transformer.

Lectures: 3 hours per week, 2 terms.
Laboratory: 3 hours per week, 2 terms.

### 901 - Engineering 441. Mechanics of Materials II

Dynamic loading, repeated loads, stress concentrations and fatigue, connections, introduction to elastic action, energy methods, theories of failure, shear centre, unsymmetrical bending, bending of curved bars, introduction to linearized mathematical theory of elasticity, introduction to elastic stability.

Lecture: 3 hours per week, 1 term.

This course formerly offered as Civil Engineering 441.

### 901 - Engineering 451 - Fluid Mechanics II

Flow over immersed bodies, one-dimensional compressible flow, introduction to fluid machinery, flow in open channels. Selected experiments in compressible, incompressible, subsonic and supersonic flow.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.

### 901 - Engineering 471. Physical Systems and Measurements II

Lectures: A continuation of Engineering 372: combined networks and 2 port network theory, closed loop systems, systems with distributed parameters.

Laboratory: Transducer elements, frequency response, digital instrumentation, multipliers.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 901 - Engineering 472. Control Theory I

Introduction to feedback control systems, equations and models of linear systems, time response, frequency response, transfer functions, stability criteria, compensation, components of feedback control systems.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 901 - Engineering 491. Mathematical Methods in Engineering

Theory and applications (with use of computers) of numerical analysis and statistics.

Lectures: 3 hours per week, 2 terms.

### 901 - Engineering 492. Advanced Mathematics

Hyperbolic functions. Further study of matrices; further study of Laplace and Fourier transforms; partial differential equations; theory of functions of complex variable.

Lectures: 2 hours per week, 1 term.

### 901 - Engineering 501. Engineering Economy and Practice

A brief introduction to economics and accounting practices; economy studies for decision making; interest and the time element in economy. Techniques for economy studies with possible special problems, such as critical path scheduling; engineering law; contracts; patents, etc.; professional ethics and liability.

Lectures: 3 hours per week, 2 terms.

### 901 - Engineering 510. Technical Report

Each Engineering student must submit a technical report on entering Engineering V. This paper should be from 2,000 to 5,000 words in length, on a topic drawn from the engineering experience of the student during his summer work.

If a suitable topic based on personal experience cannot be found, the student may apply to the Dean of the Faculty of Engineering for permission to write on a topic connected with engineering, scientific, or industrial work. The letter of permission must accompany the essay.

The report must be completely documented and illustrated, must be typewritten on one side only of 8½ x 11 inch white paper of good quality, and must be suitably bound. Students are referred to Kate L. Turabian, *A Manual for Writers of Term Papers, Theses and Dissertations*, for matters of style and notation.

This course formerly offered as Engineering 331.

### 901 - Engineering 511. Computer Organization and Software

Logical basis of computer structure; machine organization and functional units; machine programming including subroutines, linkages, macros and assembly systems; compilers and operating systems.

Lectures: 3 hours per week, 1 term.
Laboratory: 1½ hours per week, 1 term.
Prerequisite: 5th-year standing.

### 901 - Engineering 512. Operations Research

Application of mathematical models to various industrial problems: queueing theory, game theory, linear programming, inventory theory and Monte Carlo processes.

Lectures: 3 hours per week, 1 term.
Laboratory: 1½ hours per week, 1 term.
Prerequisite: 5th-year standing.

### 901 - Engineering 571. Control Theory II

Advanced topics in analysis of linear systems, statistical methods, random inputs, autocorrelation functions, optimization. Introduction to sampled-data control systems, the Z-transform, time and frequency responses. Non-linear control systems, graphical and numerical methods, method of the first harmonic, compensations, phase plane techniques, non-linear optimization.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, one term.
Prerequisite: Engineering 472.



### 901 - Engineering 572. Control System Design

Impedance matching. Detectors in feedback control systems, choice of detectors. Determination of characteristics of electric motors in feedback control systems. Hydraulic and pneumatic systems. Hydraulic motors. Use of electronic amplifiers, hydraulic amplifiers, gears, relays as amplifiers, modulators and demodulators in feedback control systems. Preliminary design of a complex feedback control system.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.
Prerequisite: Engineering 571.

### 901 - Engineering 573. Advanced System Theory

State space analysis, controllability, observability. Introduction to optimization theory, variational methods, maximum principle. General approach to filtering, Wiener's method, Kalman's methods. Dynamic programming, deterministic and random cases with finite horizons in discrete and continuous systems.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.
Prerequisite: Engineering 571.

### 901 - Engineering 575. Digital Computers in Systems

A study of the application of digital computers to control systems. Topics to be studied include sampled data systems; coding and data transmission; interfaces and analog-digital conversion techniques; simulation of discrete systems.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.
Prerequisite: Engineering 511 and 571.

## CIVIL ENGINEERING

### 903 - Civil Engineering 241. Statics

This course now offered as Engineering 241.

### 903 - Civil Engineering 341. Dynamics

This course now offered as Engineering 341.

### 903 - Civil Engineering 343. Mechanics of Materials

This course now offered as Engineering 343.

### 903 - Civil Engineering 421. Engineering Materials

General principles, stress, fracture, rheological and fatigue behaviour of materials. Cement systems, portland cement, fresh and hardened concretes, mortar, design methods. Asphalt systems, properties and design methods. Ceramics, polymers and related materials. Selection of materials for construction. Advanced science of materials, nuclear structures, radiation effects, high performance composites.

Lectures: 1 hour per week, 2 terms.
Laboratory: 3 hours per week, 2 terms.

### 903 - Civil Engineering 431. Geology

Basic principles of physical and structural geology, with emphasis on topics related to Civil Engineering; study of minerals, rocks and soil types, load formation, techniques of air photo interpretations and geological maps.

Lectures: 2 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.

### 903 - Civil Engineering 441. Mechanics of Materials II

This course now offered as Engineering 441.

### 903 - Civil Engineering 451. Theory of Structures I

Analytical and graphical analysis of statically determinate structures. Influence lines and their application to the analysis of structures subjected to moving loads. Simple space structures. Cables and suspension bridges. Approximate methods for analyzing multistory frames. Deflections of structures. Analysis of statically indeterminate structures with force or displacement methods, including superposition, slope deflection, moment distribution and column analogy. Introduction to matrix formulation.

Lectures: 3 hours per week, 2 terms.

### 903 - Civil Engineering 452. Structural Design I

Structural behaviour; design concepts, specifications and codes. Design of tension members, beams and compression members; Project type design problems.

Lectures: 2 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 903 - Civil Engineering 461. Hydrology

Principles of hydrology and methods of analysis for engineering planning and design; hydrologic cycles, data collection and interpretation; relation to air mass movements, precipitation, evaporation, stream flow, floods, ground-water, drainage, etc.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.

### 903 - Civil Engineering 471. Surveying I — Summer School

Elementary operations employed in engineering surveying; use, care, and adjustment of instruments; linear and angular measurements; traversing; earthwork calculations; theory of errors; horizontal and vertical curves and curve layout; slope stakes and grades; application of surveying methods to city, land and topographic surveying and introduction to advanced surveying techniques; use of digital computers in survey calculations.

Lectures and field work: 8 hours per day, 6 days per week, 3 weeks.

### 903 - Civil Engineering 472. Highway Engineering I

Theory of simple, reverse, compound, and spiral curves as applied to the location and design of highways; calculations of vertical curves, earthworks, overhaul and mass diagrams; calculations of sight distances, etc.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.



### 903 - Civil Engineering 531. Soil Mechanics I

Introduction to properties of soil, composition, classifications, clay mineralogy. Physical properties, thixotrophy, volumetric relationships, consistency. Water in soil, surface tension, groundwater wells, seepage theory. Consolidation and settlement, stress history and pore water considerations. Rheological and failure behaviour, experimental studies.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 903 - Civil Engineering 532. Foundations

Introduction to earth pressures and stress distributions in soils; bearing capacity. Stability analysis of slopes: practical design of foundations, piles, retaining walls, cofferdams. Experimental and case history studies.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.

### 903 - Civil Engineering 533. Soil Mechanics II

Selected topics in mechanics of soil media including water flow, rheological behaviour, failure theories, and ideal materials.

Lectures: 3 hours per week, 1 term.

### 903 - Civil Engineering 541. Experimental Stress Analysis

A study of modern experimental methods of determining stresses and strains; mechanical, electrical and optical strain gauges, photoelasticity; brittle coatings; model analysis.

Lectures: 1 hour per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 903 - Civil Engineering 551. Structural Design II

Comprehensive design projects: simple or continuous plate girders, bridges, multi-story steel frames. Introduction to plastic design.

Laboratory: 6 hours per week, 1 term.

### 903 - Civil Engineering 552. Reinforced Concrete

Study of the properties and models of behaviour of reinforced concrete and the mechanics of reinforced concrete members. Working stress and ultimate strength design. Introduction to prestressed concrete. Project type design assignments, girders, bridges, arches, pressure vessels for nuclear power.

Lectures: 2 hours per week, 2 terms.
Laboratory: 3 hours per week, 2 terms.

### 903 - Civil Engineering 553. Theory of Structures II

Classical and matrix methods of structural analysis; influence coefficients, transformation matrices. Matrix formulation of the force method and of the displacement method of analysis.

Lectures: 3 hours per week, 1 term.

### 903 - Civil Engineering 561. Hydraulic Engineering I

Introduction to the design of hydraulic structures including consideration of types and functions of dams; hydrologic design, seepage, piping, stability of earth structures. Hydrologic investigations; design of hydraulic features of water-power stations.

Lectures: 3 hours per week, 1 term.

### 903 - Civil Engineering 562. Water Resources

Water resources history. Study and evaluation of phases of river mechanics. Application of principles of hydrology and water control to problems in erosion control, flood control, water power, irrigation, navigation and river basin planning. Economic feasibility studies in river basin planning.

Lectures: 2 hours per week, 1 term.

### 903 - Civil Engineering 563. Hydraulic Engineering II

Hydraulic design of spill-ways and outlet works. Design of transitions. Design of canals, flumes, siphons, tunnels, conduits, conveyance systems.

Lectures: 3 hours per week, 1 term.

### 903 - Civil Engineering 571. Highway Engineering II

Design controls and criteria, including traffic and highway characteristics and highway capacity; cross section element; right of way problems and access control; intersection design; principles of geometric design, drainage, etc.

Lectures: 3 hours per week, 1 term.

### 903 - Civil Engineering 581. Public Health Engineering

Introduction to water supply engineering including water quality control. Water quality criteria for domestic and industrial usage; sources and types of pollution and its effects on the environment. Analysis and design of distribution systems; application of chemistry and bacteriology to the design and operation of units. Sewage treatment; municipal and industrial waste disposal; design of various types of sewage treatment plants and disposal works.

Lectures: 3 hours per week, 2 terms.
Laboratory: 3 hours per week, alternate weeks, 1 term.

## ELECTRICAL ENGINEERING

### 905 - Electrical Engineering 311. Principles of Electrical Engineering

Foundations of electric circuit theory; measurement of electrical quantities using common instruments; natural response of simple circuits; complete response and forced response of driven circuits; use of phasors with sinusoidal driving functions; network topology and equilibrium equations on mesh current and node voltage basis; network theorems; energy and power; frequency response of circuits; polyphase systems; transformers; introduction to energy conversion devices.

Lectures: 3 hours per week, 2 terms.
Laboratory: 3 hours per week, 2 terms.
This course no longer offered. See Engineering 372.

### 905 - Electrical Engineering 421. Electronics I

Characteristics of diodes, vacuum tubes, transistors, and associated devices; application to the basic processes of rectification, amplification, oscillation, and modulation.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 905 - Electrical Engineering 422. Electronics II

A further, more detailed discussion of the topics listed in Electrical Engineering 421; practical circuits for amplifiers (Class A, B, and C); oscillators, modulators, etc.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.



### 905 - Electrical Engineering 431. Electromechanics I

Energy in singly and doubly excited systems; electromechanical energy conversion principles; basic features of rotating machines; ideal d.c., polyphase induction, and synchronous machines.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 905 - Electrical Engineering 432. Electromechanics II

More detailed study of d.c., polyphase induction, and synchronous machines, including the effects of magnetic saturation; single-phase fractional-horsepower motors; transformers in 3-phase circuits; static rectifiers and inverters; application of thermal networks to the rating of machines.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.

### 905 - Electrical Engineering 441. Network Analysis

Review of fundamental circuit laws, including a more detailed discussion of network topology and two-terminal-pair networks; filters; Fourier integral and continuous spectra; introduction to distributed parameter networks.

Lectures: 3 hours per week, 1 term.

### 905 - Electrical Engineering 442. Electrical Measurements Laboratory

A laboratory course in electrical measurements based on the work of Electrical Engineering 311 and Electrical Engineering 441.

D.C. potentiometer, Wheatstone bridge and accessory equipment; a.c. bridge measurements; indicating instruments, including common ammeters, voltmeters, wattmeter, power factor meter, integrating meters such as the watt-hour meter; harmonic analysis.

Laboratory: 3 hours per week, 1 term.
This course is not longer offered. See Engineering 372 and 471.

### 905 - Electrical Engineering 451. Electromagnetic Field Theory

Maxwell's equations; static fields in several coordinate systems; time varying fields; fields in sinusoidal steady state; energy and the Poynting Vector.

Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.

### 905 - Electrical Engineering 501. Seminar

In the second term of the fifth year, students in Electrical Engineering hold meetings with faculty members. These meetings are organized to provide the student with an opportunity to exercise his ability to present and to defend his thoughts on topics of his own choice. Students will be encouraged to devote some of their discussions to such topics as continuing professional education, professional societies, organization of engineering employment, and professional ethics.

2 hours per week, 1 term.

### 905 - Electrical Engineering 511. Electrical Properties of Matter

Solid state physics; application to semi-conductors, varistors, thermistors, conductors and insulators. Photo-sensitive and luminescent materials. Piezoelectric and ferroelectric, paramagnetic and diamagnetic effects. Superconductivity.

Lectures: 3 hours per week, 1 term.

### 905 - Electrical Engineering 521. Electronics III

A continuation of the material of course EE 422; wave-shaping circuits and digital logic circuits.
Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 905 - Electrical Engineering 532. Generalized Machine Theory

Linear transformation in electric circuits analysis; power invariant transformations; primitive machines; dynamic and steady-state response of machines.
Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.
Prerequisite: EE 431.

### 905 - Electrical Engineering 551. Electromagnetic Wave Propagation

Steady-state and transient analysis of lossless and dissipative transmission lines. Plane waves in lossless media. Plane waves in dissipative media. Bounded waves, wave guides, oscillators, radiation.
Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.
Prerequisite: EE 441.

### 905 - Electrical Engineering 552. Microwave Design

Design and application of microwave generators, detectors, components, and systems. Slow wave structures. Measurement of microwave power, frequency and impedance.
Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.
Prerequisite: EE 551.

### 905 - Electrical Engineering 561. Communication Theory

Principles of amplitude, angular and pulse modulation. Components including modulators, mixers, limiters and demodulators. Representative examples of complete transmission systems. Signals in the presence of noise. Physical description of shot and thermal noise. Effect of noise on various modulation systems.
Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 905 - Electrical Engineering 562. Statistical Communication Theory

Stochastic processes, sampling theory, detection of signals in noise, optimum linear systems and filtering.
Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.
Prerequisite: EE 561.

### 905 - Electrical Engineering 571. Electrical Power System Engineering

Inductance, capacitance, resistance of polyphase transmission lines; current and voltage relations of transmission lines; load flow studies; symmetrical and unsymmetrical faults; power system stability.
Lectures: 3 hours per week, 1 term.
Laboratory: 3 hours per week, alternate weeks, 1 term.
Prerequisite: EE 431.



### 905 - Electrical Engineering 581. Electrical Engineering Design Project

The Electrical Engineering project provides an opportunity for each student to carry out a small design project associated with one or more of the specialist elective courses, under the supervision of a faculty member. The nature of the project selected should be such as to require study and a critical analysis of several articles in the current technical literature. When feasible the designs will be assessed in the laboratory. Each student is to present a complete report at the end of the project.
6 hours per week, 1 term.

## MECHANICAL ENGINEERING

### 908 - Mechanical Engineering 331. Thermodynamics I

This course now offered as Engineering 350.

### 908 - Mechanical Engineering 411. Measurements Laboratory (Mechanical)

Characterization and behaviour of typical measuring systems with emphasis on limitations; transducers, amplifiers, readout devices and their response to steady and transient phenomena.
Lectures: 2 hours per week, 1st term; 1 hour per week, 2nd term.
Laboratory: 3 hours per week, alternate weeks, 2 terms.
This course is no longer offered. See Engineering 372 and 471.

### 908 - Mechanical Engineering 412. Mechanical Engineering Laboratory I

Selected experiments in thermodynamics, heat transfer and other areas.
Laboratory: 3 hours per week, 1 term.

### 908 - Mechanical Engineering 421. Metallurgy

Phase rules and diagrams; solid system reactions and changes in microstructure; annealing, precipitation, age-hardening and austenite-martensite transformation. Laboratory: pyrometry, metallography; alloying processes, structure and properties and heat treatment.
Lectures: 3 hours per week, 1 term.
Laboratory: 1½ hours per week, 1 term.

### 908 - Mechanical Engineering 431. Thermodynamics II

This course now offered as Mechanical Engineering 451.

### 908 - Mechanical Engineering 441. Heat Transfer I

This course now offered as Mechanical Engineering 453.

### 908 - Mechanical Engineering 443. Kinematics of Machines

Study of displacement, velocity and accelerations in mechanism of machines by graphical, vector and numerical analysis methods. Mechanisms include: linkages, gearing, cams and computing mechanisms.
Lecture: 1 hour per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 908 - Mechanical Engineering 444. Dynamics of Machines

Analysis of kinematics and dynamics of mechanical systems; introduction to vibrations. Laboratory includes graphical methods and analog simulation.
Lecture: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.
This course formerly offered as Mechanical Engineering 461.

### 908 - Mechanical Engineering 451. Thermodynamics II

Thermodynamic relations and generalized coordinates; phase rules, mixtures and chemical reactions; equilibrium and non-equilibrium. Introduction to statistical thermodynamics.
Lectures: 3 hours per week, 1 term.
This course formerly offered as Mechanical Engineering 431.

### 908 - Mechanical Engineering 453. Heat Transfer I

Steady and transient conduction heat transfer; radiation heat transfer.
Lectures: 3 hours per week, 1 term.
This course formerly offered as Mechanical Engineering 441.

### 908 - Mechanical Engineering 461. Dynamics of Machines

This course now offered as Mechanical Engineering 444.

### 908 - Mechanical Engineering 511. Mechanical Engineering Laboratory II

Selected experiments in gas dynamics, heat transfer, fluid machinery and other areas.
Laboratory: 3 hours per week, 2 terms.

### 908 - Mechanical Engineering 521. Manufacturing Processes

Characteristics of materials, production of ferrous and non-ferrous metals, casting processes, heat treatment, hot and cold working, powder metallurgy, plastics, electroforming and electroplating, inspection and quality control, metal cutting operations and equipment.
Lecture: 3 hours per week, 1 term.
Prerequisite: 5th-year standing.

### 908 - Mechanical Engineering 541. Machine Design I

Fundamental theories of machine design as applied to screw-threaded members, metallic and rubber springs, solid and hollow shafts, their critical speeds, deflection and slope analysis; keys, couplings and welded and riveted joints under steady and fluctuating loading conditions.
Lecture: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.

### 908 - Mechanical Engineering 542. Machine Design II

Fundamental theories of lubrication and design of bearings, kinematics and design of gears and gear trains, design of welded and cast machine frames, manufacturing details leading to the design of a complete simple machine.
Lecture: 3 hours per week, 1 term.
Laboratory: 3 hours per week, 1 term.



### 908 - Mechanical Engineering 551. Gas Dynamics

Simple compressible flow; normal shock waves; generalized one-dimensional flow; linearization of subsonic flow equations.
Lectures: 3 hours per week, 1 term.

### 908 - Mechanical Engineering 552. Heat Transfer II

Momentum and mass transfer; combined heat transfer; phase change and heat exchangers.
Lectures: 3 hours per week, 1 term.

### 908 - Mechanical Engineering 553. Fluid Machinery

Momentum analysis for fluid propulsion, moment of momentum and Euler turbine equations, thermodynamics of gas flow, analysis of blades and impellers, performance of incompressible and compressible turbomachinery.
Lectures: 3 hours per week, 1 term.

### 908 - Mechanical Engineering 554. Environmental Control

Methods of design of domestic and commercial heating, air conditioning, and refrigeration systems.
Lectures: 3 hours per week, 1 term.
Prerequisite: 5th-year standing.

### 908 - Mechanical Engineering 555. Energy Conversion

Elements of steam, internal combustion, nuclear and hydroelectric power plants. Design of a simplified complete system and economic considerations.
Lectures: 3 hours per week, 1 term.
Prerequisite: 5th-year standing.

## COMPUTER SCIENCE

### 930 - Computer Science 211. Introduction to Digital Computer Programming

An introductory course in Computer Programming and computer use. Fundamentals of input, output, logical decisions, looping and arithmetic calculations are introduced with sufficient Fortran applications to enable the student to use the computer as a tool in his future courses and/or career. Lectures and laboratory. (Half course.)

### 930 - Computer Science 212. Computer Programming II

Prerequisite: an introductory course in Computer Programming with emphasis on Fortran. A course designed for those who wish to make computers their future career. Other languages such as auto-codes, assemblers, COBOL, ALGOL are introduced as well as some non-numerical topics such as sorting, systems controls and operating systems. Complex applications are discussed. Lectures and laboratory. (Half course.)

### 930 - Computer Science 471. Digital Computer Programming and Numerical Methods

Prerequisite: Mathematics 452 or 455 previously or concurrently. A course in computer programming oriented to senior students in the Sciences. This course will teach the students Fortran programming with applications in numerical analysis and advanced mathematical techniques. Lectures and laboratory. (Half course.)

NOTE:—This course was formerly offered as Mathematics 471. Only a half-credit will be given from among Computer Science 211, 471, Mathematics 471, Engineering 214, 371.

# Special Programmes of Study

# SPECIAL PROGRAMMES OF STUDY

## Y.M.C.A. Secretaryship Training

Young men and young women wishing to prepare themselves as Secretaries in the Canadian Y.M.C.A. may do so in the University by choosing for the Bachelor's degree the maximum possible number of courses in the Social Sciences Division and fulfilling the requirements as outlined in the "Curriculum for the Diploma in Association Science." Candidates should note that field work in a Y.M.C.A. during their academic activity is highly desirable as an experience complementary to the classroom phase of training. Suitable candidates will find such field work opportunities available under the Fellowship Training Plan of the Montreal Y.M.C.A. This plan also provides some remuneration to offset tutorial and living expenses. Applicants for the Fellowship Training Plan are directed to the Metropolitan Office of the Montreal Y.M.C.A. Those who are interested in qualifying for the Y.M.C.A. Secretaryship are directed to the following publications in pamphlet form which may be obtained from the Personnel Offices of the Montreal Y.M.C.A. or the National Council of Y.M.C.A.'s of Canada, 2160 Yonge Street, Toronto 7.

1. "Qualifications and Training for the Secretaryship of the Young Men's Christian Association."
2. "Basic Areas of Professional Competence in the Y.M.C.A. Secretaryship."

### CURRICULUM FOR THE DIPLOMA IN ASSOCIATION SCIENCE

Candidates for the Diploma in Association Science must complete the curriculum for a Bachelor's degree with five credits from the 'basic areas of preparation for the Y.M.C.A. Secretaryship' as outlined below (including all of the 'required' courses). Students who hold a Bachelor's degree from another recognized university may obtain the Diploma in Association Science by completing a minimum of five credits at the University, including necessary courses in the following programme. Students must apply to the Chairman of the Department of Applied Social Science to receive this Diploma:

**1 History, Philosophy and Organization of the Y.M.C.A.**
*Required:* Applied Social Science 211.

**2. Christian Leadership and Interpretation**
*Required:* Religion 231.
*Optional:* Religion 213, 221, 243; Philosophy 231.



**3 Administration**
*Required:* Applied Social Science 221.
*Optional:* Accountancy 211; Management 430, 432.

**4 Leadership and Supervision of Programme and Groups**
*Required:* Applied Social Science 431.
*Optional:* Applied Social Science 241, 251; Education 221; Art 211, 221, 231, 251.

**5. Guidance of Individuals**
*Required:* Applied Social Science 451.
*Optional:* Applied Social Science 452; Psychology 223, 231, 427, 451; Sociology 442.

**6. Community Organization and Relationships**
*Required:* Applied Social Science 441.
*Optional:* Sociology 221, 441, 443.

### SPECIAL SUMMER SESSIONS

The University of offering courses of study during the summer in the following subjects: Applied Social Science, English, French, Geography, and Sociology and History.

**Admission Requirements**

1. For admission to a special summer session, a regularly enrolled student must:
   a) have the necessary prerequisites for the course to be taken;
   b) be in good academic standing and have an overall "C" average;
   c) be approved by the department concerned.
2. a) Other regularly enrolled students recommended by the department may be admitted if approved by the Student Request Committee of the Faculty of Arts.
   b) The Student Request Committee may admit a student who is not approved by the department concerned, provided he is qualified under regulations 1(a) and 1(b).
3. Students will ordinarily take one or one and one-half courses. Two full credits will be the maximum allowed in any circumstances.
4. A student may register only in one special summer session. A student may register concurrently in a special summer session and the evening summer session, but in such cases the combined registration shall not exceed two credits. Registration for Applied Social Science is restricted to one half credit.

5. Outside students, not seeking a degree from Sir George Williams University will be treated in accordance with the above policies. Because of the widely varying backgrounds of such students, the Registrar's Office and the department concerned may, at their discretion, make exceptional arrangements for such students.

### Course Duration

| | |
|---|---|
| **Applied Social Science:** | 11 August—26 August (Geneva Park) |
| **English:** | 10 July—22 August |
| **French:** | 28 June—9 August |
| **Geography:** | 28 June—9 August |
| **Sociology and History:** | 10 July—22 August |

### Applications

As registration for some of the courses being offered is limited, students are requested to submit their applications as soon as possible. The departments concerned should be contacted for information on application deadline dates.

### Fees

| | |
|---|---|
| **Applied Social Science:** | $ 75.00 per half course |
| **English:** | 100.00 per course |
| **French:** | 90.00 per course |
| | 20.00 language laboratory |
| **Geography:** | 90.00 per course |
| | 15.00 field trips |
| **Sociology and History:** | 100.00 per course |
| | 50.00 per half course |

## APPLIED SOCIAL SCIENCE

**Director:** John D. Jackson, *Lecturer in Applied Social Science.*
Richard D. McDonald, *Associate Professor of Applied Social Science.*
Rix G. Rogers, *Visiting Lecturer in Applied Social Science.*

### Curriculum

**Applied Social Science 221.** Administration of Community Serving Agencies.
**Applied Social Science 431.** Supervision.
**Applied Social Science 441.** Community Development.

NOTE:—For course descriptions, see Page 114.



## ENGLISH

**Director:** Neil Compton, *Professor of English.*
C. B. Cox, *Visiting Professor of English.*
A. E. Dyson, *Visiting Professor of English.*
A. N. Kaul, *Visiting Professor of English.*
Arnold Kettle, *Visiting Professor of English.*
F. E. L. Priestley, *Visiting Professor of English.*
D. J. M. Smith, *Visiting Professor of English.*

### Curriculum

**English 436.** Victorian Literature.
**English 437.** Modern British and American Literature
**English 444.** Canadian Poets and Their Critics*.
**English 445.** American Literature.
**English 469.** Literature and Society.
**English 472.** Tennyson and Browning**.

*If taken for graduate credit, English 643.
**If taken for graduate credit, English 625.

NOTE:—For course descriptions, see Page 93.

## FRENCH

**Director:** James Whitelaw, *Professor of Modern Languages.*
Léandre Bergeron, *Assistant Professor of French.*
Albert Jordan, *Assistant Professor of French.*
Claude Lévy, *Lecturer in French.*
Serge Losique, *Assistant Professor of French.*
Jacques Perrin, *Lecturer in French.*
Mair Verthuy, *Lecturer in French.*

### Curriculum

**French 211.** Introduction to College French.
**French 214.** Intermediate College French.
**French 231.** French Canadian Literature and Culture.
**French 411.** Advanced Composition and Stylistics.
**French 425.** French Literature of the 20th Century.

NOTE:—For course descriptions, see Page 104.

## GEOGRAPHY

**Director:** Brian Slack, *Assistant Professor of Geography.*
Harry Clinch, *Associate Professor of Geography.*
Bogdan Zaborski, *Professor of Geography.*
James Young, *Lecturer in Geography.*

### Curriculum

**Geography 211.** Introduction to Human Geography.
**Geography 251.** Economic Geography.
**Geography 261.** Cartography.
**Geography 411.** Historical and Political Geography of Europe.
**Geography 421.** Historical and Political Geography of the U.S.A.
**Geography 431.** Urban Geography.
**Geography 441.** Geography of Canada, Past and Present.
**Geography 443.** Geography of the U.S.S.R.
**Geography 444.** Polar Lands.

NOTE:—For course descriptions, see Page 121.

## SOCIOLOGY AND HISTORY

**Director:** Kurt Jonassohn, *Associate Professor of Sociology.*
Scott A. Greer, *Visiting Professor of Sociology.*
Blake McKelvey, *Visiting Professor of History.*
G. Duncan Mitchell, *Visiting Professor of Sociology.*
Stephan Nowakowski, *Visiting Professor of Sociology.*
Fernand Ouellet, *Visiting Professor of History.*
Norman Pollack, *Visiting Professor of History.*
Charles Tilly, *Visiting Professor of Sociology.*
Fred W. Voget, *Visiting Professor of Anthropology.*
Samuel E. Wallace, *Visiting Professor of Sociology.*

### Curriculum

**Anthropology 211.** Introduction to Anthropology.
**Sociology 423.** Classical Sociological Thought.
**Sociology 427.** Political Sociology.
**Sociology 433.** Sociology of Deviance.
**Sociology 496.** Problems of Urbanization.
**History 426.** History of Quebec, 1795-1965.
**History 493.** History and Sociology.
**History 494.** The Rise of Industrial Society in America, 1876-1896.
**History 495.** American Urban History.

NOTE:—For descriptions of Sociology and Anthropology courses, see Page 134; for History courses, see Page 125.



## Preparation for Entrance to Graduate Faculties and University Professional Schools

A student intending to transfer after graduation from Sir George Williams University to a university graduate faculty or professional school should consult the Registrar upon entrance to the University in order that his programme of study may be planned to satisfy the entrance requirements of the university he expects later to attend, as well as the requirements for the degree or diploma he seeks in the University.

It is standard practice for university graduate schools to require of applicants not only a high standard of previous academic performance but an extended amount of undergraduate specialization in the specific subject in which the advanced degree is sought, sufficient to enable the student to commence immediately upon the graduate courses. Graduates of high standing in a general university course are therefore usually required to take additional work, sometimes to the extent of a "qualifying year", before proceeding to the work for higher degrees. Graduates in an Honours course may find that they can undertake the work for higher degrees with a minimum of qualifying courses.

## Preparation for Entrance to the Study of Medicine

Students preparing at Sir George Williams University for admission to the Faculty of Medicine of McGill University may take the B.A. or B.Sc. course, at least three years of either being required for admission, although the complete degree course is preferable and usually is insisted upon by the medical school.

Such students must be sure to include among their courses these four: Chemistry 211, Chemistry 221 or 421, Botany 211 and Zoology 222, Physics 211.

Students planning to study medicine at universities other than McGill should consult the Registrar of the selected university for information regarding required pre-medical courses.

## Preparation for Entrance to the Study of Dentistry

Students preparing at Sir George Williams University for admission to the Faculty of Dentistry at McGill University may follow either the B.A. or B.Sc. course.

The minimum requirement for admission to the dental course is the satisfactory completion of two full years of study in a recognized university or Faculty of Arts and Science (or the equivalent thereof), including courses in the following subjects: English and Mathematics, one year of each; Physics, one year with laboratory work (Physics 211); Biology, one year of General Biology or Zoology with laboratory work (half year of Botany and half year of Zoology will

be accepted, but not one year of Botany alone), (Botany 211 and Zoology 222); Chemistry, two full courses, including one full course of Organic Chemistry with laboratory work (Chemistry 211 and 221 or 421).

Students should clarify their eligibility early with the Licensing Board of the Province or State in which they intend to practice on graduation.

## Preparation for the Study of Law

Students planning to enter the study of law should take the Arts degree and should note that Article 29, Section (i) of the Bylaws of the Bar of Quebec require proof that "a candidate has followed successfully a regular course in Philosophy either before or after his admission to study law". Such students are advised, therefore, to include Philosophy 211, 221, 241, 451 among their course selections.

It should also be noted that an ability to read French easily is required for admission to the Faculty of Law at McGill University. For admission to the Faculty of Law at the University of Montreal, students require two years of university Latin and three years of Philosophy (including Logic and Ethics).

The degree of the University is approved for admission to the study of law at Osgoode Hall.

## Teacher's Class I Diploma

Regulation 130 (c) and Regulation 133 of the Regulations of the Minister of Education of the Province of Quebec provide that those who hold an acceptable degree from an approved university may be admitted to a course of training leading to a Class I Certificate, or may be permitted to upgrade to Class I Diplomas if they already hold Class II Diplomas. The Protestant Central Board of Examiners has approved the Bachelors degree in Arts, Fine Arts, Science, and Commerce from Sir George Williams University for this purpose.

## Teacher's Class II Diploma

A. Class II Diplomas shall be granted to teachers holding Class III Diplomas provided they have passed in ten papers of the Grade XI examinations and have obtained the Senior High School Leaving Certificate, or its equivalent, with passes in English (Composition and Literature) and four other subjects.

The courses that satisfy these requirements are English 221 and four of the following: French 211, Chemistry 211, Botany 211 and Zoology 222, Physics 210 or 211, Mathematics 213 or 223, Latin 211, History (any course) or Economics 221, German 211, Geography (any course), Natural Science 210, Spanish 211.

B. Alternatively, Class II Diplomas shall be granted to teachers as in "A", but one or two continuation (second year) courses may



be substituted for first-year subjects. English 221, however, is compulsory.

## Teacher's Class II Certificate

Interim Class II Certificates shall be granted to teachers holding Temporary Permits provided they have obtained credits similar to those outlined in A or B above.

High school graduates who have passed in ten papers of the Grade XI examinations may enter the Faculty of Education in the one-year course leading to the Class II Certificate if they have successfully completed the following courses:

1. English 211, 221.
2. Four of the following subjects: Natural Science 210, Botany 211 and Zoology 222, Chemistry 211, Physics 210 or 211, French 211, Geography (any course), German 211, History (any course) or Economics 221, Latin 211, Spanish 211, Mathematics 213 or 223.

As an alternative, admission to the one-year course leading to an Interim Class II Certificate may be obtained as above, with one or two continuation (second year) courses being substituted for first-year subjects. First-year English must include English 211 and English 221.

## Membership in the Chemical Institute of Canada

The degree of Bachelor of Science with the major in Chemistry that is offered by Sir George Williams University is approved as satisfying the requirements for admission to membership in the Chemical Institute of Canada under bylaws 6 and 7 of the Institute. Undergraduates, who have reached the age of seventeen, are eligible for election as *Student Members* if they are following the programme leading to the degree and major outlined in this Announcement. Graduates are eligible for election as *Junior Members* provided they are obtaining further training in approved graduate courses in Chemistry or Chemical Engineering or further professional experience approved by the Institute; upon completion of such training or experience, commencing not earlier than the first of January immediately following graduation, and provided that they have reached the age of twenty-one, they may be eligible for election as *Professional Members*. Further information may be obtained from the Chairman of the Chemistry Department.

## Other Specially Planned Programmes

Students wishing a programme of study different from any of those suggested are invited to discuss their plans with an officer of the University. Students whose mother tongue is other than English particularly are urged to take advantage of the special arrangements which can be made to suit their needs.

# Registration Procedure

## REGISTRATION 1967–68

New students are eligible to register for courses provided they have fulfilled all admission requirements and have been formally notified of acceptance. The letter of acceptance will also contain the instructions for proper registration and must be presented at the time of registration.

Former students of the past academic year will receive Registration Appointment Cards with their final report of standing for the winter term, and must present both at the time of registration as well as their student identification cards.

Former students not registered for the past academic year must pick up appointment cards at the University Records Office. These are available about mid-August.

All registering students must present themselves *in person*, at the time specified on the Registration Appointment Card. Students who wish to discuss their course selections and programmes of study may also do this during the registration period.

Payment of tuition fees is included with the registration process in conjunction with the Office of the Controller.

### WITHDRAWALS

Students who are forced to withdraw from a course or from the University are required to notify the Registrar's Office in person or in writing and give their reasons for withdrawing. Cessation of classes or notification to instructors does not constitute a formal withdrawal from the University. Final withdrawal date for first-term half courses is October 28th. Final withdrawal date for full-term courses and second-term half courses is January 31st. For financial adjustments covering withdrawals, see Page 235.

### COURSE CHANGES OR ADDITIONS

Full courses: Changes must be effected within the first ten days of classes in September.

Half courses: For first term and second term, changes must be effected within the first ten days of classes in the appropriate term.

Note that section changes are considered course changes and will thus be assessed.

# Examinations and Advancement

## EXAMINATIONS AND ADVANCEMENT

All students registered in the University are required to write the final examinations held at the close of each course.

Identification cards have been provided for each student and must be presented for admission to these examinations, including supplementals.

The grades awarded as the final standing in each subject for the academic year are given on the basis of:

(1) the year's work of the student, week by week;
(2) progress tests;
(3) the final examinations.

The matter of satisfactory attendance and an acceptable level of expression in the English language will be given consideration in assessing the final grade for each subject. The *minimum* attendance required is 50% of the lectures in each term, although the instructor may set a higher requirement than this if he sees fit.

## GRADING SYSTEM

Grades are awarded according to the following system:

| | |
|---|---|
| A | Excellent |
| B | Very Good |
| C | Good (Average) |
| D | Pass |
| F | Fail (failed final examination—may write supplemental) |
| R | Fail (failed final examination plus unsatisfactory attendance and/or incomplete term work—must repeat course for credit; or failed supplemental examination) |
| Inc | Fail (term work incomplete) |
| Abs | Fail (absent from final examination) |
| S | Credit (late completion of term work or passed supplemental) |

All grades remain permanently on the records. All grades on final examinations (including F, R, Inc, Abs whether cleared later or not) are reported on transcripts.

### Re-reading of Examinations

All examination papers graded "F" or "R" are carefully re-read by the instructor before final approval of the grade. However, any student may request, within two weeks of the release of grades, that his paper be re-read by a committee which includes the instructor and at least one other impartial professor. Application to have an examination paper re-read must be submitted to the Director of Examinations on a form which may be obtained from the Registrar's Office. A fee of $10.00 must accompany the application. If the grade is raised, the fee is refundable.



## REGULATIONS

## ARTS, SCIENCE AND COMMERCE

### Failures

#### Definition of a Failed Year—

(Failure includes the grades F, R, Inc, and Abs)

1. A student who fails courses equivalent to more than two credits in any academic year is considered to have failed the year.
2. A student who fails courses equivalent to two credits in each of two consecutive years is considered to have failed the (second) year.

#### Regulations Concerning a Failed Year

1. A student who has failed a year may not write supplemental examinations or complete courses marked incomplete.
2. A student who has failed a year may not reregister, but may seek readmission.
3. A student who has failed a year may be readmitted on a final trial basis by the Dean of his faculty or the Registrar.
4. A student readmitted on a final basis must pass the next five credits for which he registers. He will not be allowed to re-register if he fails any course (even a half credit) during a trial year.
5. The maximum load during a trial year is five credits for a Day Division student and two credits for any Evening Division student.
6. A student who completes his trial academic year successfully, reestablishes his position as a student in good standing, and is governed by the ordinary regulations.
7. If a student who has been successfully reinstated after a trial year fails courses equivalent to more than two credits in any subsequent academic year, he may not register. He may not apply for readmission.
8. The regulations concerning a failed year became effective for all students on June 1, 1963.

#### Final Limit on the Number of Failures

It is recognized that the first year at university represents a transitional period for most students. We do not charge failures during the first year (*as defined below*) against the maximum permitted total. Failures during the first year are, however, subject to all other regulations.

A student is considered to be in his first academic year until he has *registered for* his fifth credit, either here or at some other institution.

1. After the session in which a student has registered for his fifth credit, he may accumulate no more than five failures (whether cleared by supplemental examination or not) during the remainder of his programme. A student who exceeds this limit will not be allowed to reregister. He may not apply for readmission. (Failure in a supplemental examination is not counted under this regulation. Failure in a repeated course is counted.)

2. This regulation applies to all students who have not successfully completed first year by June 1, 1963; and to all students subsequently admitted. Students in second year (or higher) by June 1, 1963, are not subject to this regulation. Such students will continue to come under the regulation now in effect:—after completion of his first five courses, no student may take more than twenty-two courses to meet the requirements for a degree.

### Supplemental Examinations

1. A student who has failed a year may not write supplemental examinations in courses taken during that year.

2. A student may not write a supplemental examination in a repeated course, nor may he write a second supplemental examination in the same course.

3. After completion of his first year (first year includes the session during which he *registers for* his fifth credit, either here or at another institution), a student may write supplemental examinations for a maximum of three credits during the remainder of his programme.

4. A student may write supplemental examinations for a maximum of two credits in his first year. These are not charged against the allowable maximum stated above.

5. "To write" a supplemental examination is interpreted as "to attempt to pass" it. A student who writes supplemental examinations in courses equivalent to three credits has used up his allowance, whether he passes the examinations or not.

6. If a student applies for permission to write a supplemental examination and the permission is granted, he is presumed to have written. Absence from such a supplemental examination is counted as a failure and is charged against the permissible maximum.



7. Medical reasons (certified by a physician on the form provided by the University) comprise a valid excuse for exemption from most of the regulations concerning supplemental examinations.
   a) A student absent from a regular examination for medical reasons may, if he wishes, write a supplemental examination. If he passes he will receive a letter grade and will not be charged with a failure nor a supplemental under the maximum permissible allowances. If he fails he will be charged with both a failure and a supplemental.
   b) A student absent from a supplemental examination for medical reasons is not considered to have failed the examination.
8. Supplemental examinations in courses taken during the regular session must be written not later than the following July. Supplemental examinations in courses taken during the Summer Session must be written not later than the following December.
9. Supplemental examinations may be written only at one of the following external examination centres in Canada: St. John's, Newfoundland; Sackville, New Brunswick; Murray Bay, Quebec; Montreal, Quebec; Toronto, Ontario; Sudbury, Ontario; Port Arthur, Ontario; Winnipeg, Manitoba; Saskatoon, Saskatchewan; Banff, Alberta; Vancouver, British Columbia. Any student wishing to write a supplemental examination at an external centre (outside of Canada) must have an appointment with the Director of Examinations before submitting an application.
10. Supplemental examinations are graded only as S (pass), R (fail), or Abs (absent).
11. Application to write a supplemental examination must be submitted to the Director of Examinations *no later than June 24th* on a form which may be obtained from the Registrar's Office. Students applying to write a supplemental examination at an external centre must submit the additional external application form with the regular application form. The required fee must accompany all applications.
12. The regulations concerning supplemental examinations became effective on June 1, 1963 for all students who have not completed first year by that date, and for all students subsequently admitted. Students in second year (or higher) on June 1, 1963, are as of that date, subject to all of the regulations concerning supplemental examinations as listed above, except for number 3. No new maximum limit is imposed on such students.

NOTE: A student who fails courses in excess of the number that may be cleared by supplemental examinations may be unable to complete his degree in four years. Other regulations of the University will *not* be relaxed in order to allow this.

### Completion of Courses Graded Incomplete

1. A student who has failed a year may not complete a course, taken during that year, that has been graded incomplete.
2. Application to complete a course graded 'Inc.' must be submitted to the Director of Examinations. The final date for submitting such an application is June 24th. Forms are available at the Registrar's Office. The required fee must accompany all applications. The limiting dates for submission of work are:
   a) For first-term courses in the regular session, not later than the following April 1st.
   b) For all other courses in the regular session, not later than the following August 1st.
   c) For all courses in the summer session, not later than the following November 1st.

   NOTE:—The instructor can require earlier completion.
3. Late completions are graded only as S (pass) or R (fail) except for medical reasons (see regulations concerning supplemental examinations).
4. The regulations concerning the completion of incompletes became effective for all students on June 1, 1963.

### Repetition of Courses

1. A student may repeat a failed course only once.
2. A student who fails a course that is specifically required for a degree must take the course during the Session in which he next registers. If a required course is taken for the first time during the Summer Session and is failed, the student may postpone his registration for repetition of the course until the Session following the regularly scheduled supplemental examination period for Summer Session courses.
3. If a student repeats a course that is specifically required for a degree and fails it a second time, he may apply to Faculty Council for permission to substitute an alternate course. Unless such permission is granted he will *not* be allowed to continue in the University toward that degree
4. The regulations concerning repetition of courses became effective for all students registering for the first time during or after the Summer Session, 1963; and to all courses taken for the first time during or after the Summer Session, 1963 by students previously registered.



## ENGINEERING

1. A student in Engineering who fails more than two full courses has failed the year and must repeat it (if permitted to do so) for credit.
2. A student in Engineering may write supplemental examinations in not more than two full courses, and not more than three papers, each year.

# Fees

# FEES

## Day Division

| | |
|---|---|
| Arts, regular programme (with one lab or problem period) | $450.00 |
| Fine Arts, regular programme (with two studio periods) | 475.00 |
| Science, regular programme (with two labs or problem periods) | 475.00 |
| Commerce, regular programme (with one lab or problem period) | 450.00 |
| Engineering I, II, III, (with lab fees) | 525.00 |
| Engineering IV, V, (with lab fees) | 650.00 |
| Partial student, per course | 100.00 |
| Special Summer Session (full course) | 100.00 |
| Special Summer Session (half course) | 50.00 |
| Additional course | 90.00 |

## Evening Division

| | |
|---|---|
| Half course | 45.00 |
| Full course | 90.00 |
| Engineering, maximum winter session (including lab fees) | 280.00 |

## Laboratory Fees

| | |
|---|---|
| For each subject involving a lab or problem period in addition to those included in fees above | 40.00 |

## Graduate Fees

| | |
|---|---|
| Tuition, full-time | 400.00 |
| Tuition, half-time | 250.00 |
| Tuition, beyond 1st full year | 50.00 |
| Master in The Teaching of Mathematics (per course) | 100.00 |
| Non-resident | 10.00 |
| Application Fee | 10.00 |
| Late Registration Fee | 10.00 |
| Graduation Fee | 25.00 |
| Re-submission of thesis | 25.00 |
| Language supplemental | 10.00 |

## Incidental Fees

| | |
|---|---|
| Student Activities: | |
| Students' Association Fee | 15.00 |
| Athletic Fee | 15.00 |
| University Centre Fund | 5.00 |



## Additional Fees

| | |
|---|---|
| Application Fee | 10.00 |
| Associate Diploma Fee | 5.00 |
| Course and/or Section Change Fee (per subject) | 5.00 |
| Deferred Payment — 2 installments | 5.00 |
| Deferred Payment — 5 installments | 10.00 |
| Effective Reading Course | 35.00 |
| Engineering Certificate | 5.00 |
| Graduation Fee | 10.00 |
| Issuance of Certificate of Registration (Additional) | 1.00 |
| Re-reading of paper (refundable if grade is raised) | 10.00 |
| Removal of Incomplete | 10.00 |
| Replacement of Identification Card | 5.00 |
| Special Examination Fee, per paper | 15.00 |
| Special Registration Fee | 10.00 |
| Supplemental Examinations, per paper (written at S.G.-W.U.) | 10.00 |
| Supplemental Examinations, per paper (at other Canadian centres) | 15.00 |
| Supplemental Examinations, per paper (at external centres) | *15.00 |
| Transcript Fee (each issuance) | 1.00 |

*Note:—Invigilation fee not included.

## Policy on Payment of Tuition Fees

On registration students contract to pay the full tuition fees for the courses selected for the academic year. Any student under 21 years of age must be accompanied by a parent or a guardian who will sign the tuition contract, or provide the University with the written consent of the parent or guardian when making a tuition contract with the University. These contracts are binding and may be cancelled only at the discretion of the Controller.

Normally, tuition and other fees are paid in full at the time of registration. With the permission of the Controller's Office, students may apply to pay their fees in installments. In this case, a minimum deposit as indicated in plan "A" must be paid at the time of registration. Registration is not considered complete in any case until students have complied with the regulations of the Registrar's Office and have paid the prescribed deposit or have made arrangements for payment, approved by the Controller's Office.

All tuition accounts not paid in full on or before October 1st are subject to a deferred payment fee as scheduled.

All contracts are subject to revision for adjustment of errors.

## EVENING

| | ½ Course | 1 Course | 1 Course plus 1 Lab. | 1½ Courses | 1½ Courses plus 1 Lab. | 2 Courses |
|---|---|---|---|---|---|---|
| Registration | $45.00 | 90.00 | 130.00 | 135.00 | 175.00 | 180.00 |
| A Registration | 26.00 | 50.00 | 70.00 | 72.00 | 95.00 | 95.00 |
| A January 4 | 24.00 | 45.00 | 65.00 | 68.00 | 85.00 | 90.00 |
| B Registration | 19.00 | 36.00 | 48.00 | 49.00 | 61.00 | 62.00 |
| B Per month (4) | 9.00 | 16.00 | 23.00 | 24.00 | 31.00 | 32.00 |

## DAY UNIVERSITY

The following plans are available for students who have been given permission to pay fees in installments:

| | Arts | Science | Commerce | Engin. I - III | Engin. IV - V |
|---|---|---|---|---|---|
| Registration | $485.00 | 510.00 | 485.00 | 560.00 | 685.00 |
| A Registration | 290.00 | 290.00 | 290.00 | 300.00 | 390.00 |
| A January 4 | 200.00 | 225.00 | 200.00 | 265.00 | 300.00 |
| B Registration | 175.00 | 200.00 | 175.00 | 210.00 | 255.00 |
| B Per month (4) | 80.00 | 80.00 | 80.00 | 90.00 | 110.00 |

NOTE:—The above figures include the $35.00 Student Activities Fee.



## UNIVERSITY

| | 2 Courses plus 1 Lab. | 2 Courses plus 2 Labs. | 2½ Courses | 2½ Courses plus 1 Lab. | 2½ Courses plus 2 Labs. | 3 Courses |
|---|---|---|---|---|---|---|
| Registration | $220.00 | 260.00 | 225.00 | 265.00 | 305.00 | 270.00 |
| A Registration | 115.00 | 135.00 | 120.00 | 140.00 | 160.00 | 140.00 |
| A January 4 | 110.00 | 130.00 | 110.00 | 130.00 | 150.00 | 135.00 |
| B Registration | 94.00 | 126.00 | 99.00 | 127.00 | 147.00 | 136.00 |
| B Per month (4) | 34.00 | 36.00 | 34.00 | 37.00 | 42.00 | 36.00 |

### Withdrawals and Adjustments

Any student who withdraws from a course or from the University is required to notify the Registrar's Office in person or in writing and to give reasons for withdrawing. Withdrawal from classes does not entitle a student to refunds of fees or cancellation of contract without the permission of the Controller's Office. No withdrawals will be accepted after January 31 (October 28 for first-term courses).

(1) Applications for contract adjustments must be presented no later than two weeks after the beginning of the University term. If a student cancels a course or courses within this period, the adjustment is 75% of the fee for each full course, 50% of the fee for each half course scheduled in the first term and all of the fee except the registration deposit of $10.00 for each half course scheduled in the second term. If a student cancels a second-term half course during the first two weeks of the second term, the adjustment is 50% of the fee. **After the two-week period immediately following the beginning of classes (for second term half-courses, immediately following the beginning of classes in the second term) no refunds or adjustments are allowed for any reason.**

(2) Failure to attend classes shall not be considered a cancellation of contract.

(3) In the event that the University grants a refund, the following fees are not refundable, viz.: fees for course changes; late registration; removal of incompletes; supplemental examinations; student societies; mature matriculation; and application fee.

(4) A registration deposit of $10.00 per subject (full or half course) will be charged for cancellation before the start of the term.

(5) An applicant who has paid $250.00 for guaranteed admission to the Day Division will forfeit this payment in the event that registration is not completed or if the application is withdrawn or cancelled after acceptance, regardless of the reason.

An evening student who has previously obtained special permission to register for more than the normal course load is not granted any adjustment for the cancellation of any courses.

Failure to make payments of tuition, fees, or other amounts owed the University, when they fall due, or to arrange for such payments before their delinquent dates, is considered sufficient cause, until the debt has been adjusted with the Controller's Office, to (1) bar the student from classes or examinations, and/or (2) withold diploma, scholastic certificate, or transcript of record.

# Financial Aid

## SCHOLARSHIPS, BURSARIES AND LOAN FUNDS

### General Information

(a) The University utilizes a basic application form for all scholarships and bursaries. This form can be obtained from the Office of the Dean of Students, and must be submitted before June 1st of each academic year.

(b) To be eligible for the majority of the scholarships and bursaries listed, the applicant must have completed five full credits at this University.

## SCHOLARSHIPS AND BURSARIES

***Abner Kingman Scholarships:*** In the Evening Division only, five scholarships of $50.00 each, endowed by personal gift of the late Abner Kingman in 1928, awarded annually to students who have attended the University for at least one academic year and who show great promise.

***D. A. Budge Memorial Scholarships:*** In the Evening Division, a series of scholarships in memory of the late D. A. Budge from the bequest of the late W. G. Cheney, tenable in Sir George Williams High School. Four of these scholarships are tenable in the first year of the University in the Evening Division, on the basis of work done in the final year of the High School.

***Birks-Beaton Memorial Scholarship:*** Established by the Metropolitan Board of the Montreal Y.M.C.A. in memory of the late Gerald W. Birks, President of the Young Men's Christian Association of Montreal from 1922 to 1950 and the late John W. Beaton, General Secretary from 1920 to 1951. This scholarship of $150.00 is to be awarded annually, when merited, to a Y.M.C.A. fellowship student on the basis of academic standing after having completed at least one year at Sir George Williams University.

***John W. Ross Memorial Scholarship:*** In the Day Division, this scholarship of $150.00, established by the family of the late John W. Ross, President of the Young Men's Christian Association of Montreal from 1905 to 1915, is awarded annually to a Y.M.C.A. fellowship student on the basis of academic standing.

***The Montreal Hi-Y Scholarship:*** A scholarship of $150.00 per year, for a maximum of a four year period, is to be offered annually to a Montreal high school graduate who has been, in his or her final year at high school, an active member of a Hi-Y Club. Selection will be based on academic standing, activity and leadership potential. Applications for this scholarship must be submitted before August 15th each year.



***National Council of Jewish Women (Montreal Section) Scholarship:*** A scholarship of $100.00 is awarded annually to an undergraduate student in the Evening Division of the Arts faculty, who has achieved high scholastic standing and is in need of financial assistance.

***The Hugh Millar Scholarship Fund:*** The sum of $500.00 is made available to day or evening Engineering students, in any year, who have good academic achievement and who need financial assistance to pay for tuition fees.

***J. H. Andrews Limited Scholarships:*** In the Day Division, a sum of $1,000.00 to be awarded to a student who has completed the first year of the Commerce degree curriculm. The award is to be distributed over the remaining three-year period of study. Satisfactory scholastic standing will be expected at the end of each academic year. The recipient must be a Canadian citizen.

***Zeller's Scholarships:*** In the Day and Evening Division, two scholarships of $100.00 each, to be awarded on the basis of high scholastic achievement in the third year of the Commerce degree curriculum.

***The Maynard Metcalf Scholarship:*** In the Day Division, a scholarship of $100.00 awarded to a student in any year or faculty for outstanding scholastic achievement during the preceding academic year.

***Consolidated Paper Corporation Limited Entrance Scholarship:*** In recognition of the importance of assisting youth who have the required ability and qualities of leadership and to defray expenses required to obtain a university education, an annual scholarship of $500.00 tenable for four years is awarded to an entering day student in the Faculty of Arts or Commerce. Preference will be given to the son, daughter or legal ward of a permanent (or deceased) employee of the Corporation.

***The Building Trades Joint Committee Scholarship:*** A five-year scholarship is available to a student entering into the Faculty of Engineering. This award covers full tuition fees for five years subject to a satisfactory academic standing. Applicants must be the sons of employees or employers engaged in the construction industry in the District of Montreal.

***Touche, Ross, Bailey and Smart Scholarship:*** This scholarship is in the amount of $200.00 and will be awarded annually to a student who is completing his third year and will be entering his final year, majoring in Accountancy in the Faculty of Commerce, and who intends on graduation to pursue the qualification of Chartered Accountant. The award will be made by the Scholarship Committee on the basis of academic record, ability, personality and other suitable characteristics.

***Max Cohen Entrance Scholarship Fund:*** In the Day Division, two scholarships awarded to a needy student with academic achievement beginning or during the first year of study.

***Ross High School Scholarship:*** The sum of $500.00 is made available to a day student in Arts, Science or Commerce on the basis of high scholastic standing. This scholarship is awarded annually at the discretion of the University Scholarship Committee.

***Henry I. Chinks Memorial Scholarship:*** Awarded annually on the basis of need and academic standing to an evening student in the Faculty of Science, in the field of Chemistry.

***Alvin J. Guttman Memorial Scholarship:*** A scholarship of $100.00 is available annually to a student from Africa or Asia. This scholarship is awarded at the discretion of the University Scholarship Committee.

***Kenneth E. Norris Memorial Entrance Scholarships:*** Designated for students with high scholastic standing, four scholarships will be awarded each year to entering first-year students. Awarded on a competitive basis, each scholarship has a value of $500.00 a year for a total of $2,000.00 through the undergraduate programme. The application deadline is August 15th.

***Henry F. Hall Scholarship:*** Established by the faculty and staff in recognition of the many years of service given to the University by Dr. H. F. Hall, Principal Emeritus, this scholarship is awarded annually on the basis of merit to a student in any faculty of the University, Day or Evening Divisions.

***The P.T.R. Pugsley Memorial Scholarship:*** Established by friends of the late Professor Pugsley to commemorate his many years of service as Senior Professor of the Commerce faculty of the University. The scholarship of $150.00 is awarded annually to an outstanding student in the Faculty of Commerce, Day or Evening Division.

***Octad Educational Fund:*** This fund, sponsored by friends of the University, was established to be of assistance to students in pursuing their studies. Awards are made through the University Scholarship Committee from continuation application forms.

***Knights of Pythias (Syracuse Lodge No. 9):*** This fund was established by the Knights of Pythias to assist students in the Day or Evening Divisions of the University. Primarily the fund is to provide critical assistance to a student at any point during the academic year.



***St Patrick's Society of Montreal Bursary:*** Awarded annually by the St. Patrick's Society to an undergraduate on the basis of need and passing grade. The award is made by the St. Patrick's Society on the recommendation of the University Scholarship Committee.

***J. P. Copland Memorial Bursary Fund:*** The J. P. Copland Memorial Bursary Fund was established by the Reverend E. Bruce Copland, Mr. C. Leslie Copland and Mrs. Marion C. Sanborne in loving memory of their father, and in recognition of his service to young people. The late J. P. Copland was a member of the Metropolitan Board of the Montreal Y.M.C.A. for forty-three years.

***Reubin Ross Memorial Bursary:*** Awarded annually, to a needy student in the day or evening University, at the discretion of the University Scholarship Committee.

***Garnet Key Alumni Scholarship:*** In recognition of the leadership opportunities afforded members of the Garnet Key Society through their year of service in the Key, and in appreciation of the positive educational and personal experiences while students at Sir George Williams University, the Alumni of the Garnet Key Society has established a scholarship designed to provide assistance to a needy deserving student who has achieved scholarship standing.

***The Systems and Procedures Association (Montreal Chapter) Scholarship:*** The Montreal Chapter of the Systems and Procedures Association has established this scholarship to assist in the development of future business leaders through the provision of financial assistance to deserving students in the Commerce faculty. Awards are made on the recommendation of the Dean of Commerce.

***Riddell, Stead, Graham and Hutchison Service Award:*** Awarded annually to a third-year Commerce student entering fourth year with the intention of continuing studies with a practising firm of Chartered Accountants on graduation. The award, consisting of payment of tuition and other fees for the final year, will be made, on recommendation of the Dean of Commerce.

***Mount Royal I.O.D.E. Scholarship:*** In the Day Division, a scholarship of $100.00 is awarded to a needy student in the Science faculty who demonstrates scholastic ability.

***Richard and Edith Strauss Foundation Scholarship or Bursary Programme:*** In the Day and Evening Divisions, a fund to be awarded at the discretion of the Scholarship Committee on the basis of need and academic standing.

***Special Donation:*** A donation received in honour of Mrs. Bertha Cohen to the Students' Emergency Loan Fund.

***P.E.O. Scholarship:*** In the Day or Evening Division, a scholarship of $50.00 is awarded annually to a student in any year who demonstrates scholastic ability and has the need of financial assistance to pay tuition fees.

***Royal Albert Lodge:*** The sum of $400.00 to be awarded as scholarships or bursaries to, a) children of members of the Royal Albert Lodge, b) children of members of other Masonic Lodges. If neither a) nor b) qualify, any worthy student may apply and receive the scholarship or bursary at the discretion of the University.

***F. B. Walls Scholarships and Bursaries:*** In the Day and Evening Divisions, a fund of $1,000.00 per annum to be awarded at the discretion of the Scholarship Committee on the basis of need and academic standing.

***L. W. Anderson Scholarships and Bursaries:*** In the Day and Evening Divisions, a fund of $500.00 per annum to be awarded at the discretion of the Scholarship Committee on the basis of need and academic standing.

***Continuation Scholarships and Bursaries:*** In the Day and Evening Divisions, twenty scholarships and bursaries are provided for students who, having completed one academic year at the University, have need of financial assistance. These awards will pay for half the tuition fees in the case of a scholarship and one-third the tuition fees in the case of a bursary.

***I. M. Segals Scholarships and Bursaries:*** A fund of $500.00 is available to assist needy students and is awarded at the discretion of the University Scholarship Committee. These awards are available to students in any faculty, Day or Evening Divisions.

***The IBM Thomas J. Watson Memorial Bursary Programme:*** IBM makes available $1,000.00 annually to each of a number of Canadian universities to provide undergraduate bursaries which are known as the IBM—Thomas J. Watson Memorial Bursaries. The objective of the programme is to provide financial assistance to needy undergraduates in any year of any faculty who are of good academic standing.

***Birks-Beaton Memorial Bursary:*** This bursary of $150.00 is awarded annually, when merited, to a Y.M.C.A. fellowship student in his or her first year at the University by the Metropolitan Board of the Montreal Y.M.C.A. It is established in memory of the late Gerald W. Birks, President of the Young Men's Christian Association of Montreal from 1922 to 1950 and the late John W. Beaton, General Secretary, from 1920 to 1951.



***National Council of Jewish Women of Canada Bursaries:*** In the Day and Evening Divisions bursary awards are provided according to financial need. It is expected that students will undertake to repay grants after graduation.

***The Mitsu Tamura Tani Memorial Bursary:*** In the Day and Evening Divisions, a fund of $100.00 per annum to be awarded to help a deserving and needy student whose life-work is in the field of service to mankind.

***John Crawford (Administrative Management Society) Bursary:*** $100.00 will be awarded annually as a bursary to a deserving student in the Evening Division of the Commerce faculty in memory of the late John Crawford, Charter Member and First President, 1938-40, Montreal Chapter, National Office Management Association, International President, 1941-42, N.O.M.A., lecturer at Sir George Williams University for many years, and who showed an interest and devotion to matters of education worthy of special recognition by his associates in N.O.M.A.

***The S. H. McNeilly Bursary:*** A $75.00 bursary is available annually to a student who is employed by the Canadian Pacific Railway Company. This bursary is awarded to an evening student in the second year of any faculty of the University based upon scholastic achievement and need.

***Louis Steinman Memorial Bursary:*** In the Day Division, an amount of $100.00 to be awarded annually, when merited, to a third or fourth-year student majoring in Applied Social Science. This bursary will be granted on the basis of scholastic achievement and need at the discretion of the Scholarship Committee.

***The Birks Family Foundation Bursaries:*** The bursaries are available to students recommended by the University, in any faculty. They may be renewed annually until graduation, to successful students. The number and amount of awards may vary from year to year depending on the funds available from the Foundation.

***Harold Ross Bursary:*** A $100.00 bursary is available to a student annually in the field of Humanities. This award is tenable in the Day or Evening Divisions and selection will be made at the discretion of the University Scholarship Committee.

***St. Andrew's Society of Montreal Bursary:*** The amount of $200.00 is available annually to a needy student of Scottish blood or descent, studying in the Day or Evening Divisions of any faculty.

***Theodore Ronis Memorial Bursary:*** This bursary of $50.00 is established by the friends of the late Theodore Ronis to perpetuate the memory of his friendship through the annual gift of a bursary to a deserving student. The recipient should be studying preferably but not necessarily towards a Bachelor of Commerce degree, in the Day or Evening Division, and be a male student.

***Ernest Haznof Memorial Bursary:*** The sum of $100.00 is available as a bursary to a needy, deserving student in the field of Philosophy. If, in one year, there are no suitable applicants this bursary will then be given to a student in a related field at the discretion of the University Scholarship Committee.

***The Steel Company of Canada Bursary:*** This year, the Steel Company of Canada has announced the inclusion of Sir George Williams University in their national educational assistance plan, and has established a STELCO Entrance Bursary available to a student who is a permanent resident of Canada. This award has a four-year value of $2,000.00 provided satisfactory standing is maintained each year, and is available to a student who has attained a minimum average of 66% in the High School Leaving Examinations.

***Nomads of Avrudaka Bursary:*** The sum of $100.00 is available annually to a needy, deserving student studying in the Day Division of any faculty, and is awarded at the discretion of the University Scholarship Committee.

***Dominion Rubber Company Limited Bursary-Loan Fund:*** In the Day Division, awards are provided on the basis of need and academic standing, to students who have completed at least two years at University. It is expected that the students will undertake to repay 25% of the aid received after graduation.

## LOAN FUNDS

***Montreal-Westward Rotary Club Student Loan Fund:*** In the Day Division loans are available, without interest, to any worthy student of Notre Dame de Grace, Montreal West, Ville La Salle, Ville St. Pierre, and Lachine who is not otherwise able to meet the expenses of a university education. All loans are to be paid back in monthly installments, commencing six months after graduation.

***Dr. Hirsh and Mrs. Dora Rosenfeld Free Loan Fund:*** An annual fund of $500.00 is available to assist needy students at university level. These loans are issued to students with the understanding that some time in the future, when the student is established and in a position to do so, he will repay the loan to Sir George Williams University thus making it possible for another student to receive a loan.



***Harry F. Bennett Educational Loan Fund:*** This fund provides loans to deserving students who have completed first year studying Engineering Sciences at university level. Further information, and application forms can be obtained from the Office of the Dean of Students.

***Student Loan Fund:*** The Association of Alumni Student Loan Fund grants financial assistance to students. These loans are based solely on the student's financial need. All loans are repayable within two years of graduating from or leaving the University, or if the student continues his studies elsewhere, upon graduating from or leaving that college or university to which he may transfer.

***Province of Quebec:*** The Province of Quebec has an extensive programme of bursary-loan assistance available to Canadian citizens who are residents of the Province of Quebec. Information may be obtained by writing to:

Student Aid Service,
Department of Education,
Parliament Buildings,
Quebec City 4, Quebec.

Please note that all application forms *must* be submitted *before* September 30, and *should be sent registered mail.*

***Province of Quebec Postgraduate Scholarships:*** The Province of Quebec, Department of Education offers a limited number of postgraduate scholarships to students who have successfully completed a university (honours) degree, and who require financial assistance. To qualify, students must have resided in the Province of Quebec for at least one year prior to their application. Please note that all applications must be completed and submitted to the Department of Education by January 14th — the year prior to the commencement of graduate study. Application forms and information brochures can be obtained by writing to:

Student Aid Service,
Department of Education,
Parliament Buildings,
Quebec City 4, Quebec.

***Canada Student Loan Plan:*** Information concerning the Canada Student Loan Plan may be obtained from the Office of the Dean of Students.

## PRIZES

**The Birks Medal** awarded annually, when merited, by Henry Birks & Sons (Montreal) Ltd., to the highest ranking graduating student in Arts.

**The Mappin Medal** awarded annually, when merited, by Mappin's Ltd. of Montreal to the highest ranking graduating student in Science.

**The Charles E. Frosst Medal** awarded annually, when merited, by Charles E. Frosst & Co., to the highest ranking graduating student in Commerce.

**The Morris Chait Memorial Prize in Engineering,** awarded annually, when merited, to the highest ranking student completing the Certificate in Engineering programme.

**The Board of Governors Medal for Creative Expression** awarded annually, when merited, by the Board of Governors of the University to the student or students giving evidence in independent work outside the classroom of outstanding ability in creative expression in English or the fine arts, — creative writing, oratory, drawing, painting, drama, or music.

**First Graduating Class Award.** The first graduating class of the Faculty of Arts, Science and Commerce, known as the Guinea Pig Club, a name symbolic of their pioneering experience, makes a presentation, when merited, to the student who is adjudged to have made the most outstanding new contribution, either academic or extra-curricular, to the student life of the University.

**Association of Alumni Award** awarded annually, when merited, to the graduating student, who, in the opinion of the Faculty Council of the University, has by his activities, achievements, and interest, during his term at the University, won the outstanding commendation and respect of his fellows and of the faculty.

**Governor-General's Medal.** A medal, presented by His Excellency the Governor-General of Canada, will be awarded annually to the graduating student showing the highest achievement in the field of English language and literature.

**The Lieutenant-Governor's Silver Medal for History:** Awarded annually, when merited, to the student with the highest standing in the History major.



**The Lieutenant-Governor's Bronze Medal for Mathematics or for Mathematics and Physics:** Awarded annually, when merited, to the student with the highest standing in Mathematics or in the major in Mathematics and Physics.

**Le Prix Villard** founded by the students in the French Classes of the University in 1942-43 "pour récompenser, chaque année l'étudiant qui s'est le plus intéressé et distingué dans l'étude de la langue et de la littérature françaises," and continued since his death, as a memorial to the late Dr. Paul Villard, by one of his former students, Mr. Yves Gallet.

**The J. W. Bridges Medal for Psychology:** Awarded annually, when merited, to the student with the highest standing in Psychology. This prize was established by his colleagues of the faculty to honor the outstanding contribution of Dr. J. W. Bridges, Professor Emeritus and former Chairman of the Department of Psychology.

**The Sun Life Prize in Economics** awarded annually, when merited, by the Sun Life Assurance Company of Canada, to the graduating student with the highest standing in the Economics major.

**The Canadian International Paper Company Prize in Biology,** a cash prize of $100.00 to be awarded annually, when merited, to the graduating student with the best record of work in the field of Biology.

**The C.I.L. Prize in Chemistry,** a cash prize of $50.00 to be awarded to the graduating student with the highest standing in Chemistry courses.

**Merit Award, The Society of Chemical Industry–Canadian Section,** awarded annually, when merited, to the student majoring or honouring in Chemistry with the highest standing in the final year of this course.

**The Chemical Institute of Canada Prize** awarded annually to the best third-year student entering fourth year and majoring in Chemistry.

**Hebrew Culture Organization of Canada Prizes,** Samuel Kizell Memorial Prize of $50.00 awarded annually, for excellence in the study of the Hebrew language.

An additional prize of $50.00 awarded annually, for excellence in the study of the Hebrew language.

**The Ross Medal** awarded annually, when merited, by Dr. Howard I. Ross to the graduating student with the highest standing in the Accountancy major.

**The Investment Dealers Association of Canada Medal,** awarded annually to the student who obtains the highest standing in Corporation Finance.

# Student Life

# STUDENT LIFE

## University Council on Student Life

Established in 1964, this Council includes representatives from the student body, faculty, university administration, and Board of Governors. It is responsible to the Principal for the student life of the University, and develops recommendations in appropriate areas. It also receives all student constitutions.

The Executive is composed of Associate Professor F. W. Bedford (Chairman), the President of the Students' Association of Sir George Williams University, and the Dean of Students.

## Co-Curricular Programme

Student programme is made up of many and varied activities, and the Students' Association and the Evening Students' Association accept responsibility for the planning and implementation of these activities.

This is in line with the philosophy of Sir George Williams University which incorporates the concept of 'total-learning'; the belief that learning opportunities which occur outside the classroom are just as important as the formal type. In fact, the University strongly supports this part of the learning process and hopes that every student will take some part in these activities. The co-curricular programme is part of the University's educational process and its emphasis is focussed on complementing and reinforcing academic efforts toward educating the student.

The Office of the Dean of Students offers the resources of its staff to work with, and for, students and faculty, in creating experiences which contribute to the learning-impact of a co-curricular programme.

STUDENT GOVERNMENT. The primary purpose of student government is to provide students with the means to administer student-sponsored activities, organizations, publications and any other matters subject to their jurisdiction. A further role, is to represent the student body in dealing with the rest of the University, other universities, government, and the general public. Individual participation in a leadership capacity is regulated by academic requirements stipulated in the student constitutions. It is through the Students' Association and the Evening Students' Association that the students are offered a wide range of social and cultural programmes. In addition, leading educators, businessmen and public figures visit the University as guests of the students.



STUDENT PUBLICATIONS. All student publications, including the newspaper, "The Georgian", and the yearbook, "Garnet", are financed out of student activity fees, and are under the jurisdiction of the Publications Commission of the Students' Association.

GEORGIAN PLAYERS. Students may participate in major theatre productions through the Georgian Players, a student group which has professional supervision and direction.

CHORAL SOCIETY. The Choral Society, which is open to all students, faculty and staff, is under the direction of Frank Armstrong.

INTERNATIONAL SEMINAR. The students at S.G.W.U. have, for the last seven years, held a week-long seminar on an important aspect of international affairs. This seminar has the highest reputation and annually attracts top speakers and participating students from around the world.

GARNET KEY SOCIETY. The Garnet Key Society is an Honour Society instituted to represent the University as hosts at special events, to orient students to university life, and to provide general assistance to the University and its legally constituted entities. A Garnet Key Society member may be identified by uniform while on duty. Male members wear a Garnet jacket, white trousers, and Garnet Key tie, while female members wear a white blazer and Garnet skirt.

# STUDENT SERVICES

UNIVERSITY CHAPLAINS. The following have been appointed by the various denominations to meet the religious needs of interested students.

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| Rabbi Samuel Cass | Chaplain | Jewish |
| Rev. John Guy | Chaplain | Student Christian Movement |
| Rev. I. D. Morrison | Chaplain | Anglican |
| Rev. A. B. Moore | Counsellor | United Church |
| Rev. G. P. Predelli | Chaplain | Roman Catholic |
| Rev. S. Athanasoulas | Chaplain | Greek Orthodox |
| Rev. A. Vedell | Chaplain | Lutheran |

RESIDENCE. (Men) Some men students may reside in theYMCA dormitory which occupies the building adjacent to the University. A limited number of rooms is available at a special student rate for full-time day students during the academic year. Information about such reservations should be obtained in advance from the Residence Secretary, Central YMCA, 1441 Drummond Street, Montreal, Quebec.

RESIDENCE. (Women) The residences of the Montreal YWCA or the Julia Drummond Residence, within walking distance of the University, are recommended for women students. Particulars may be obtained from the Institutional Manager, YWCA, 1355 Dorchester Street West, Montreal, Quebec, or the Superintendent of the Julia Drummond Residence, 1208 St. Mark Street, Montreal, Quebec.

HOUSING. The Office of the Dean of Students prepares a list of rooming houses, apartments and homes that are available for students from outside Montreal.

STUDENT ACCIDENT AND SICKNESS INSURANCE. Sir George Williams University offers a comprehensive accident and sickness plan to all day students. This group plan has been endorsed by the Students' Association and is written through the agency of William Clelland & Son, Ltd., Montreal. The programme is designed to help students and parents meet the high financial cost of medical expenses due to accidents and sickness sustained while attending the University. Through this voluntary group plan, the students is insured for the full twenty-four hours each day during the policy term of one year, at a cost less than half of that which would be incurred if the same coverage were obtained on an individual basis. Commencement date of the coverage is the first day of classes in the Fall. Overseas students attending the University are provided special coverage at additional cost, since they are not covered under the Quebec Hospitalization Plan.

HEALTH SERVICES. The University Health Centre is located in the sub-basement of the Hall Building, Room 003, with a smaller unit in the basement of the Norris Building, Room 002. Both Centres are staffed with Registered Nurses, Monday through Friday from 8:30 a.m. to 10:00 p.m., in the Hall Building, and from 10:00 a.m. to 10:00 p.m. in the Norris Building. Appointments to see the doctor may be made by calling Local 4010. The Centre can refer students to the various specialists and is equipped to give treatment for headaches, first aid, and minor injuries. A rest area is also provided. Students may receive allergy injections in the Centre if they provide their own vaccine accompanied by written instructions from their doctor.

OVERSEAS AND OUT-OF-TOWN STUDENTS. In 1966-67, there were 205 students from 27 countries registered at the University in addition to 214 Canadian students from outside Montreal. The emphasis in working with overseas students is assimilation into the student body in recognition of the contribution they can make to campus life. To help meet the needs of overseas students, a student Advisory Board meets regularly to discuss mutual needs, programmes and student reception. This committee comprises of representatives of the different overseas student groups on campus and as such is truly qualified to deal with foreign student affairs. The introductory handbook is one of the projects of the committee, and it has been learned from foreign students that it is useful as a ready source of information prior to their departure from home.



Further information on STUDENT LIFE and STUDENT SERVICES may be obtained from the Office of the Dean of Students.

## ATHLETICS

The University is a member of the Ottawa-St. Lawrence Athletic Association, and the Canadian Intercollegiate Athletic Union. The O.S.L.A.A. is a ten-member association of universities and colleges in the St. Lawrence Valley area. A strong rivalry exists within the Association.

Sir George sponsors representative teams in fifteen different activities on the intercollegiate level. Participation in the intercollegiate athletics programme is encouraged. The University's athletes have amassed an enviable record as well as a fine reputation in athletics.

The intramural programme is varied and includes team sports as well as individual and special interest events. The women students are offered participation in intercollegiate, intramural and recreational activities. The women's programme is not as extensive as the men's but is showing considerable increase each year.

The athletics programme is governed by the University Athletics Council, a Council with representation from all phases of the university community.

ELIGIBILITY. Participation in intercollegiate athletics is dependent upon satisfactory academic performance and is limited to full-time registered day students. *Full-time registered day university students may not compete for outside organizations without written permission from the Athletics Council.* These regulations are academic in nature, and are designed to prevent a student from becoming involved in a programme which is detrimental to his scholastic progress.

RESPONSIBILITY OF UNIVERSITY. While every reasonable precaution will be taken to prevent accidents, students are reminded that participation in athletics and other curricular or extra-curricular activities in the University is entirely at their own risk. Students competing in intercollegiate athletics are covered by an athletics accident insurance policy. Other participants may purchase the same coverage at a nominal cost through the Students' Association. The University accepts no responsibility for the loss of personal effects.

## GRADUATES

ASSOCIATION OF ALUMNI. The Association of Alumni was organized by the first graduating classes of the University in 1937, to perpetuate the fellowship established in their years at the University, to preserve an interest in education, and to work extramurally for the welfare of the University. Each University undergraduate automatically becomes a member upon graduation and eligible for all the benefits of membership. The Association not only publishes a quarterly magazine, "THE POSTGRAD," which is sent to all members and any others interested in the University, but is also ready to give assistance or advice to any undergraduate or graduate.

KENNETH E. NORRIS MEMORIAL LECTURES. In 1961, the Association of Alumni, in co-operation with the University and the Student Societies inaugurated an annual series of guest lectures by outstanding men of our time in memory of the late Kenneth E. Norris, Principal of Sir George Williams College from 1936 to 1956.

Further ALUMNI information from Mr. John F. Ferguson, Executive Director, Alumni.

## OFFICE OF GUIDANCE SERVICES

Education being considered the process of stimulating and guiding the growth of individual students, all of the incidentals of education —instructors, courses of study, textbooks, examinations—are vauable only insofar as they serve these ends. To help students identify and obtain their educational goals, the University has for many years offered a programme of educational, vocational and personal guidance and counselling for its students. While all members of the administrative staff and faculty are responsible for student guidance as a part of their duties, and while several of these members possess a background of experience in the techniques of such work, a trained counselling staff consisting of professional psychologists, is primarily responsible for the co-ordination and development of the Office of Guidance Services.

### Guidance

In recognition of the varying interests, aptitudes, and vocational aims of its students, the University offers a full programme of educational and vocational guidance. Extensive use is made of methods for determining a student's aptitudes, abilities, interests, and other personality characteristics. All students are encouraged to contact the Office of Guidance Services early in their academic careers concerning orientation to academic work, problems involving study habits, selection of suitable courses of study, and the choice of a vocation. Counsellors are prepared to assist students with such problems at any time.

### Guidance Library

A special reference library of psychological and vocational information is maintained as a supplement to the student guidance services. This library includes information on personal and industrial applications of psychology, various vocational fields, techniques of improving verbal skills, and many other topics. There is also an extensive Careers Section providing comprehensive up-to-date information on a wide variety of professional, industrial and business vocations. The Library also includes a large collection of graduate and professional school announcements from universities of many countries to assist the student in further educational planning. Information on financial aid for postgraduate studies is also available.

### Effective Reading

As a service to students whose problems stem from poor reading and study habits, the Office of Guidance Services offers a programme of training in effective reading techniques. Designed to improve reading skill in all its aspects, the course consists of a series of 16mm films, tachistoscopic training, and drill exercises for directing attention to comprehension and critical reading. This course is given as frequently as possible during the year for both day and evening students.



### Personal Counselling

It is not unusual that, during the time spent in gaining an education, a student may be faced with complex personal or emotional problems. Although these problems may not directly involve university studies, they may have a serious effect on them. Since such difficulties have a direct bearing on the development of the student as a person, the Office of Guidance Services offers whatever assistance is possible. Both psychological and psychiatric counselling are provided.

### Placement

In co-operation with the Canada Manpower Centre, a Placement Office with three full-time officers is provided for students of the University. Through this Office the full resources of the Canada Manpower Centre are made accessible to all students seeking part-time employment during the academic year, employment during the summer, and employment upon graduation.

**Students and their parents are urged to take full advantage of the above services.**

### Psychological Testing Programme

All applicants (freshmen and upperclassmen) are required, as part of the admission process, to complete a psychological testing programme. This is designed to collect information about the personalities, aptitudes, interests, and study methods of the students involved. Such information is subsequently used as a basis for admission and for academic, vocational, and personal counselling and guidance.

In addition, mature matriculation applicants to the Evening Division of the University as well as applicants to other units of Sir George Williams University and Schools may be required to write tests at the Sir George Williams University Testing Centre. The Testing Centre also offers test scoring services and other facilities to institutions and organizations in the community.

# Facilities and Services

## FACILITIES OF THE UNIVERSITY

Sir George Williams University and the five Sir George Williams Schools occupy a six-storey building on Drummond Street, the second and third floors of the Y.M.C.A. immediately adjacent to it, and the newly-opened Henry F. Hall Building.

**Laboratories.** The University has approximately 100 laboratories and draughting rooms with modern equipment to assist in the teaching of such subjects as Biology, Chemistry, Physics, Engineering, Statistics, Psychology, Geography, and Language.

**Computer Centre.** In line with the growing effect of computers on today's society the University operates a modern, up-to-date Computer Centre. Designed to serve the whole University community including students, faculty, and administration, the Centre is equipped with two electronic computers. These are a small-scale IBM 1620 (equipped with most accessories) and a much larger more powerful Control Data Corporation 3300 time-sharing computer. The latter computer is specifically oriented to provide easy access and fast turnaround time in addition to high computational power. Both computers are supported by a professional staff ready to aid faculty and students in their work.

In addition to its support function, the Computer Centre also offers a number of courses in Computer Science. These courses, available to students in all faculties, are designed to provide a knowledge of, and an understanding of how to use computers. Other courses are offered for those students wishing to specialize in the computer field.

**Studios.** Art studios are available for work in drawing, painting, graphics, design and sculpture.

**Auditoria.** One auditorium in the K. E. Norris Building, with a seating capacity of 400, is fully equipped with stage, dressing-rooms and scene shop. It is called Birks Hall of honour of the late Colonel Gerald Walker Birks. A second auditorium accommodating 700 and a theatre seating 350 are located in the Henry F. Hall Building. There are eight additional auditoria.

**Art Galleries.** The three galleries, located on the second floor indoor campus of the Hall Building display works from the University collection. Consisting of 220 pieces of art, it is considered one of the largest collections of contemporary Canadian art in the country.

**Libraries.** The Unversity libraries under the direction of trained librarians, make available a growing collection of books, periodicals, government publications, microforms, and other library materials



for circulation or reading room use. The Main Library, which provides materials mainly in Arts and Commerce subjects, is located on the fifth and sixth floors of the Norris Building. Seating is provided for approximately 400 students. The Science and Engineering Library is located on the tenth floor of the Henry F. Hall Building and can seat 130 students. There are study rooms on the fourth floor which provide seating accommodation for approximately 285 students.

**Chapel.** The Captain's Chapel, with its modern-romanesque architecture, stained glass, and organ, provides an atmosphere conducive to quiet meditation and spiritual inspiration.

**Gymnasium and Swimming Pool.** Students, on request, are entitled to Central Y.M.C.A. membership cards which provide full membership privileges to day students and limited privileges to evening students during the academic terms.

**Food Services.** The University has a complete food service operation. The main student dining room and snack bar is located on the seventh floor of the Henry F. Hall Building. This location offers a good variety of tasty, balanced, wholesome meals, a wide choice of short order items, and courteous and friendly service in comfortable, pleasant surroundings, all at budget prices. In addition, a refreshment centre featuring over seventy-five popular snack bar items is located on the fourth floor of the Norris Building. Facilities are also available for banquets, teas, meetings, parties and dances. For further information in this regard please contact the banquet manager located on the seventh floor of the Hall Building.

**Residences.** Sir George Williams University is a non-residential institution, and students from out-of-town are responsible for their own living arrangements. For further information see Page 251.

**University Bookstores.** All books and supplies, including art materials required, may be bought at the University Bookstore, 2085 Bishop Street, near the Hall Building and operated on a self-service basis. Students are reminded to consult a book-list to insure the correct edition before purchasing. A new Paperback Store, located in the basement of the Hall Building has approximately 8,000 titles in stock for supplementary reading lists. It is also self-service. Additionally, a self-service rush arrangement will be available in the parking garage of the Hall Building during registration. Books required by Commerce students are sold at the bookstore on the third floor of the Y.M.C.A.

**Centre for Human Relations and Community Studies.** The Centre, located on the third floor of the Norris Building, is a research, consultation and training service of the Department of Applied Social Science. It is designed to promote an understanding of the human dimension of organizations and the social environment in which they operate and to provide information, procedures and training programs that have direct application to the solution of organization or community problems. The Centre is staffed by an inter-disciplinary team of professional psychologists, sociologists, educators and social workers. It works as consultants to a wide variety of organizations and associations, as well as the government, business and industry. Students may be involved in Centre programmes through courses in the Department of Applied Social Science and especially through the Project Seminar which is available to fourth-year majors in the department.

**University Reserve Units.** These are organized as sub-components of the Reserves of the three Services as follows:

(a) Navy — University Naval Training Division (U.N.T.D.). This has been established to select and train male undergraduates for a naval commission in order to build up a reserve of trained officers of high calibre in the Canadian Navy. For complete details, apply to:
H.M.C.S. Donnacona,
2055 Drummond Street.

(b) Army — Canadian Officers Training Corps (C.O.T.C.). This organization trains selected male students for commissions in the Canadian Army, regular or militia. Those interested may submit their names to the University C.O.T.C. Selection Board:
Commanding Officer,
Major John Hall.

(c) Air Force — University Reserve Training Plan (U.R.T.P.). This plan is designed to qualify university students, male and female, for commissions in the reserve or regular components of the Air Force. Full details may be obtained at:
Sir Arthur Currie Gymnasium,
475 Pine Avenue West.

(d) Regular Officer Training Plan (R.O.T.P.). This scheme permits students, particularly in the professional faculties, to receive generous subsidization for their education in return for limited service with any one of the three branches of the armed forces. Further information can be obtained from any of the above organizations.

# Cancelled and Altered Courses

## CANCELLED COURSES

The following courses are no longer offered and have been dropped from the curricula. Course descriptions for all of the following can be found in the previous Announcement.

| | |
|---|---|
| Chemistry 431L. | Physical Chemistry Laboratory. |
| Geography 232. | Geomorphology. |
| History 434. | Social History of Modern Britain. |
| History 492 | Historical Development of Social Change in Africa. |
| Social Science 251. | General Semantics. |
| Sociology 238. | The Social Origin of Law. |
| Sociology 251. | The Social Origins of Canadian Law. |
| Sociology 431. | Medical Sociology. |
| Sociology 447. | Race and Culture. |

## ALTERED COURSES

The following course titles and/or course numbers have been changed:

| | |
|---|---|
| Administration 421. | See Management 421. |
| Administration 430. | See Management 430. |
| Administration 432. | See Management 432. |
| Administration 433. | See Management 433. |
| Administration 451. | See Management 451. |
| Administration 452. | See Management 452. |
| Administration 453. | See Management 453. |
| Biology 211. | See Botany 211. |
| Biology 222. | See Zoology 222. |
| Biology 411. | See Botany 411. |
| Biology 412. | See Botany 412. |
| Biology 413. | See Botany 413. |
| Biology 414. | See Botany 414. |
| Biology 421. | See Zoology 421. |
| Biology 422. | See Zoology 422. |
| Biology 423. | See Zoology 423. |
| Biology 424. | See Zoology 424. |
| Biology 425. | See Zoology 425. |
| Biology 431. | See Zoology 431. |



| | |
|---|---|
| Biology 451. | See Zoology 451. |
| Biology 461. | See Zoology 461. |
| Biology 471. | See Zoology 471. |
| Commercial Law 211. | See Management 211. |
| Commercial Law 441. | See Accountancy 441. |
| Management 411. | See Finance 416. |
| Mathematics 471. | See Computer Science 471. |
| Quantitative Analysis 411. | See Quantitative Methods 411. |
| Sociology 221. | See Sociology 421. |
| Sociology 243. | See Sociology 465. |
| Statistics 242. | See Quantitative Methods 242. |

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